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ABSTRACT

This publication explores the enlistment potential of college-market youth by examining the characteristics of the college-market population and the implications of these characteristics for designing effective recruiting policies. Chapter 1, "Introduction: Trends and Theoretical Considerations" (M. Rebecca Kilburn, Beth J. Asch), provides an overview of recent trends as well as some theoretical reasons why recruiting college-market youth makes sense. Chapters 2-4 then investigate different aspects of the youth college market. Chapter 2, "Trends in Intentions to Enlist and Attend College" (Chris Bourg), examines the individual choice to enlist for individuals very early in the decision process. It explores trends in intentions to enlist and to attend college among American high school seniors and the relationship between these trends. Chapter 3, "Paying for College: A Survey of Military and Civilian Financial Aid Programs and Postsecondary Education Costs" (C. Christine Fair), compares civilian financial aid programs, military educational programs, and college costs to assess the relative attractiveness of current educational recruiting incentives. Chapter 4, "The Enlistment Potential of College Students" (Beth J. Asch, M. Rebecca Kilburn), analyzes the enlistment potential of different segments of the college market (e.g., two-year and four-year students and dropouts). It examines some policy options available to target the college population, such as loan repayment programs, paying higher wages for more education, paying for tuition, or enlistment bonuses. (Appendixes include relative risk ratios; multinomial logit coefficients for year of study; breakdown of numbers of schools by category in each state; data collection and analysis; case studies of financial aid bundling strategies; details of predicted probability estimates; and additional tables.) (YLB)

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CURRENT PRACTICES AND FUTURE POLICY OPTIONS

EDITORS

M. REBECCA KILBURN

BETH J. ASCH

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Prepared for the Office of the Secretary of Defense

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PREFACE

The armed services prefer to recruit high-quality youth because of their better performance and lower attrition. However, high-quality youth are increasingly interested in attending college. This two-year project explored the potential to make military service more compatible with college plans instead of being perceived as an alternative to attending college. In the first report, *Attracting College-Bound Youth into the Military: Toward the Development of New Recruiting Policy Options,* by Beth J. Asch, M. Rebecca Kilburn, and Jacob Alex Klerman (RAND, MR-984-OSD, 1999), we documented the trends in college attendance and civilian labor market returns to higher education. That report also reviewed current opportunities to combine military service and higher education, and discussed some new policy options. This second report is an edited volume that contains four chapters, each of which explores a different facet of recruiting college market individuals. The report should be of interest to those concerned with military recruiting as well as to the larger defense manpower research community.

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SUMMARY

Military recruiting has become more difficult in recent years. For the first time in two decades the services failed to meet their recruiting targets for fiscal year (FY) 1999. While the unusually strong labor market of the 1990s undoubtedly played some role in recent recruiting difficulties, another long-term demographic trend is likely to also contribute to recruiting woes: the large growth in college attendance in recent years. Traditionally, the services have targeted the recruitment of those youth who have no immediate plans to attend college. However, because high-quality youth are increasingly likely to choose to attend college right after high school, the services may benefit from considering whether they could target this group. The services might be able to significantly expand their pool of potential recruits by adopting policies that target youth who plan to go to college or who actually do go to college immediately following high school. We call this group *youth in the college market.*

RAND conducted a study to provide information to help the services assess their current programs to target the recruitment of youth in the college market and to develop new policies to reach this group. The first year of our study documented demographic trends that point toward college-bound youth as a potential recruiting market and documented the ways the services compete with the college market by offering opportunities to combine military service and college. The results of the first part of the study are summarized in *Attracting College-Bound Youth into the Military: Toward the Development of New Recruiting Policy Options* (Asch, Kilburn, and Klerman, 1999).

The second part of the study further explores the enlistment potential of college-market youth by examining in more detail the characteristics of the college-market population and the implications of these characteristics for designing effective new recruiting policies. The results of this analysis are reported in the current volume. The report has four chapters. The first provides an overview of recent trends as well as some theoretical reasons why recruiting college-market youth makes sense. The next three chapters then investigate different aspects of the youth college market. The second chapter examines trends in intentions to enlist and to attend college among American high-school seniors and the relationship between these trends. The third chapter compares civilian financial aid programs, military educational programs, and college costs to assess the relative attractiveness of current educational recruiting incentives. The last chapter analyzes the enlistment potential of different segments of the college market (e.g., two-year and four-year students and dropouts). We summarize the main findings of these chapters next.

COLLEGE MARKET TRENDS AND ECONOMIC THEORY POINT TO THE ENLISTMENT POTENTIAL OF THE TWO-YEAR COLLEGE MARKET

The supply of young men in the military's traditional market—those who do not immediately attend postsecondary educational institutions following high school—has declined since the 1970s for two reasons. First, the fraction of high school graduates who attend college within two years of graduation has grown from about half to about two-thirds. This growth in college attendance reflects the big rise in labor market returns to a college degree rather relative to a high school diploma. Second, the overall size of the youth population has declined since 1980 from about 2.2 million to 1.9 million, further lessening the supply of youth to the military's traditional market.

Although the downturn in the size of the youth population has also hurt the supply of college-market youth, the growth rate in college attendance has partially offset this downturn. Therefore, the overall size of the college-bound market has stayed about the same whereas the size of the non-college-bound market—the military's traditional market—has shrunk markedly.

Nearly half of the increase in college enrollment between 1980 and 1994 was attributable to the increase in attendance at two-year colleges. Despite the numerical importance of this segment of the college market, researchers are less familiar with this group than with the four-year college segment. Students at two-year colleges exhibit characteristics that suggest they may have enlistment potential. Although two-year colleges originally focused on preparing students to transfer to four-year institutions to obtain bachelor's degrees, less than 15 percent of two-year entrants actually receive bachelor's degrees. In addition, dropout rates are high among two-year students. About half of these students never attain a postsecondary degree. Part-time enrollment is also common among two-year students. About two-thirds of two-year students attend school on a part-time basis. The high dropout rate, part-time enrollment rate, and the relatively low transfer rate to four-year colleges suggest that these students may not be strongly attached to schooling as a postsecondary school activity, and that they may be "trying out" school to determine if they are indeed "college material." These features of two-year students all suggest that this segment of the college market may have significant enlistment potential.

While these trends indicate that the two-year college market might be a rich source of recruits, economic theory suggests that the military should not abandon the traditional market. Rather, a more efficient strategy would be one that enlists those individuals from both the traditional market and the college-bound market who have the greatest interest in the military.

YOUTH WITH SOME INTEREST IN THE MILITARY SEE THEMSELVES AS TWO-YEAR COLLEGE MATERIAL

In light of the increase in college attendance in recent years, it is no surprise that college intentions among high school seniors have risen as well. Trends in college intentions have not been well documented in the past. Using data on a nationally representative sample of high-school seniors interviewed in the Monitoring the Future survey, our study finds that roughly 50 percent more youth say they definitely will graduate from a four-year college today than at the inception of the All-Volunteer Force (AVF) in 1974. Seniors are also more definite about their two-year college plans. When asked about their plans to

attend a two-year college, more students today are indicating that their two-year plans are in the two "Definitely" categories—"definitely won't" and "definitely will" graduate—than they were at the beginning of the AVF. At the same time that college intentions have been rising, military enlistment intentions have fallen, consistent with the results of the military's Youth Attitude Tracking Survey (YATS). The fraction of seniors who say they definitely won't serve in the military rose from 57 percent in 1976 to 74 percent in 1995. The drop in positive propensity has been even sharper for black males.

College and military intentions are not independent. This relationship is important to understand because the implications for recruiting policy of the rising interest in college depend on the relationship between college and military intentions. If preference for military service rose as preference for college grew, then an increase in the fraction of youth interested in college may not be detrimental to recruiting. However, if interest in the military drops when intentions to attend college rise, then an increase in the fraction of recent graduates attending college is likely to make recruiting much more difficult.

The study tends to find an inverse relationship between college intentions and military intentions. Individuals who say they won't enlist have positive two- and four-year college intentions. On the other hand, those who say they probably will enlist have positive two-year college intentions, but negative four-year intentions. Put differently, those with some interest in the military see themselves as two-year college material but not four-year material.

These results suggest that recruiting policies that allow youth to combine college—especially two-year college—and military service are likely to be attractive to those with some interest in enlistment. Opportunities to combine college and military service are also likely to have some attraction to those with less interest in joining the military, since those who report less definite interest in military service comprise at least half of those who eventually enlist.

MONTGOMERY GI BILL BENEFITS COVER ONLY TUITION COSTS BUT THE COLLEGE FUNDS COVER TOTAL COSTS AT PUBLIC SCHOOLS

Given the interest in college among potential enlistees, a relevant question is how the current level of college benefits offered by the military compares to other sources of financial aid and to college costs. Our study addressed this question and also examined trends in federal financial aid opportunities and military educational benefits over the past decade.

As an alternative source of college aid and the largest source of aid, federal financial aid can either help or hurt military recruiting. One recent trend that is likely to benefit recruiting is the decline over the last decade in the average federal financial aid award. Consequently, students are getting, on average, less money for college from this source of funds and may find military educational benefits more attractive now than in the past, all else being equal. Another recent trend has been a major shift away from grant aid toward loan aid. That is, students are more likely to get aid that requires repayment. This trend will help recruiting to the extent that students will be more attracted to military benefits that do not require repayment.

However, despite the decline in the average award, the fraction of students receiving federal aid has grown. Furthermore, the next-largest source of aid after federal aid—state aid—has grown significantly in recent years. In addition, colleges are now leveraging their own institutional funds to compete for the best students. These trends may be detrimental to recruiting insofar as they represent important alternatives to military educational benefits.

The largest military educational benefits program in terms of enrollment is the Montgomery GI Bill (MGIB) and the "add-ons" to this benefit, namely the Army College Fund and Navy College Fund. Under these programs, the individual uses the benefit after satisfactorily completing his or her service requirement and after contributing $1,200. In the case of the College Funds, the individual must also be a high-quality enlistee and enter specific, usually hard-to-fill, occupational specialties. For a four-year enlistment, the maximum MGIB benefit in FY 1999 was $540 per month for 36 months (or $19,440);

the maximum College Fund benefit for a four-year enlistment in a critical skill by a high-quality enlistee was $50,000.

The extent to which MGIB and College Fund benefits cover college costs depends largely on what type of school one is examining—public or private—and what type of costs one is considering—tuition costs only or total costs, which also include room and board costs. The college funds go much farther toward funding a college education than does the MGIB. In general, the MGIB covers all tuition costs at public schools whereas the college funds cover total costs at public schools and about half of total costs at the majority of private schools.

The level of MGIB and College Fund benefits has received considerable attention recently, starting with the report of the Congressional Commission on Servicemembers and Veterans Transition Assistance (also known as the Pricipi report, after the chairman of the commission, Anthony Pricipi), which was released in January 1999. Subsequent to the report, numerous bills were introduced in Congress in 1999 to enhance the MGIB benefit. Nearly all of the bills eliminated the member's contribution. The Senate bills tended to increase the monthly benefit, up to $600, while the House bills sought to base the benefit on tuition costs as well as to provide a monthly stipend. While an assessment of the relative merits of these proposals is beyond the scope of this report, our analysis suggests that the current level of educational benefits, especially the college funds, already provides veterans with the ability to cover tuition costs at public institutions.

THE TWO-YEAR COLLEGE GROUP HAS THE GREATEST ENLISTMENT POTENTIAL AMONG THE COLLEGE MARKET

Insofar as the military will find it valuable to target the enlistment of college-bound youth—and our research suggests that this is indeed the case—the design of future policies to attract college-bound youth should consider which group should be targeted: entrants, dropouts, or graduates from two-year or four-year colleges. Some policies may be more effective than others with a specific college group. For example, although college students may find a policy that offers basic

pay while they attend school attractive, dropouts might be more responsive to a policy that offers a bonus to those with some college who enter the military in the near future. The decision of which college-market group to target for enlistment depends on the enlistment potential of each group.

Our study assesses the enlistment potential of different college groups using both data that track the college and career path of college entrants and the results of a previous study that identifies the characteristics predicting a youth's probability of enlistment. We use this information to investigate which segment of the college market is most likely to have the characteristics associated with enlistment. We examine not only those characteristics associated with being eligible to enlist, such as age, aptitude, and health status, but also those associated with an interest in enlisting, such as mother's education and parent occupation. The data we use capture a representative sample of individuals who entered college for the first time in 1989 and follow them until 1995.

The study finds that the two-year market, and two-year dropouts in particular, are more likely to have characteristics associated with enlistment and are therefore likely to be the most promising source of recruits among individuals who started college. We examined characteristics that are associated with being eligible to enlist, such as indicators of academic ability and physical health, and characteristics associated with interest in enlisting, such as ethnicity and parents' occupation. Although students in the four-year college market also displayed many characteristics associated with being eligible to enlist, this group was less likely than two-year college students to have characteristics associated with an interest in enlistment.

The study also highlights some alternative policy options available to target the enlistment of the college population, including college loan repayment, paying higher basic pay for postsecondary education, paying for college tuition, and enlistment bonuses. We find that two-year students are likely to be responsive to a policy that offers a stipend, higher pay, or other means of offsetting the cost of attending school. Although tuition costs are relatively low for two-year students, the opportunity cost of their time, i.e., the fact that the time spent in school could have been used to work in a paid job, is relatively high. Consequently, the cost of attending school for two-year

students can be significantly higher than simply tuition costs. Policies that offset these costs may be effective with this group, especially since two-year students are only half as likely to get financial aid as four-year students and the amount they receive is less.

The military currently has a policy that allows those who enter service with college to enter at a higher paygrade. We find that this policy does not result in a significant gain in first-term compensation. First-term compensation increases by only about 5 percent for those who enter the Army with two years of college given the structure of the military's basic pay table, and time-in-service and time-in-grade requirements for promotion to higher grades. Although strictly comparable civilian data are unavailable, available information suggests that the relative return to two years of college in the private sector is significantly higher than 5 percent: The difference in the civilian labor market between the mean real wage of someone with an associate's degree and someone with a high school diploma is 30 percent. If the military is going to successfully compete with the private sector, the relative amount it pays those with some college must be substantially greater than current policies provide. The higher pay could come in the form of a college enlistment bonus, even faster promotion speed (and the waiving of time-in-service and time-in-grade requirements for promotion), or higher basic pay in the form of a years-of-service credit for having some college. These alternatives are meant to be suggestive. Additional research is needed to ascertain which types of policies would be the most effective.

Whatever new programs are adopted to attract college-market youth, an important element of the implementation plan must include a recruiting infrastructure that ensures the success of the programs. The current recruiting infrastructure is configured to successfully target the non-college-bound market. Minimal efforts in the 1980s to enlist college-bound youth often failed because the programs were not well funded and were peripheral to the main efforts of the recruiting commands. New policies to recruit youth in the college market cannot be adopted in a "business as usual" environment. They must be well funded and part of an overall comprehensive strategic plan to select, train, and motivate recruiters to successfully penetrate the college market, to generate leads, and to develop meaningful long-term relationships with two-year colleges. Without a shift in the way

the services go about recruiting, efforts to attract college-market youth will be marginally successful, at best.

Each service will need to discover what changes should be made to its recruiting methods and what policies it finds most effective. This experimentation will take some time. Therefore, developing policies to tackle the college market should be part of each service's long-term recruiting strategy.

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ACRONYMS AND ABBREVIATIONS

AA	Associate's degree
ACF	Army College Fund
AFQT	Armed Forces Qualification Test
AFSC	Air Force Specialty Code
ALAS	Auxiliary Loans to Assist Students
AMEDD	Army Medical Department
AVF	All-Volunteer Force
AY	Academic year
BA	Bachelor's degree
BPS	Beginning Postsecondary Students Study
CATI	Computer-assisted telephone interviewing
CF	College Funds
CH	Credit hour
COA	Cost of attendance
CPI-U	Consumer Price Index for All Urban Consumers
EFC	Expected family contribution
FAFSA	Free Application for Federal Student Aid
FFEL	Federal Family Education Loan

FSEOG	Federal Supplemental Educational Opportunity Grants
FY	Fiscal year
GED	High school equivalency diploma [test]
GPA	Grade Point Average
HDG	Highest degree granted
HEAR	Higher Education Act Reauthorization
IADT	Initial Active Duty for Training
IPEDS	Integrated Postsecondary Education Data System
LEEA	Lilly Endowment Educational Awards
LRP	Loan Repayment Programs
MGIB	Montgomery GI Bill
MOS	Military Occupation Specialties
MtF	Monitoring the Future
NCES	National Center for Education Statistics
NELS	National Education Longitudinal Survey
NLSY-79	National Longitudinal Survey of Youth-1979
NPSAS	National Postsecondary Student Aid Study
NTE	Not to exceed
PLUS	Parents' Loans for Undergraduate Students
PSUs	Primary Sampling Units
ROTC	Reserve Officer Training Corps
RRR	Relative Risk Ratio
SEOG	Supplemental Educational Opportunity Grants
SES	Socioeconomic status

SH	Semester hour
SSIG	State Student Incentives Grants
TA	Tuition assistance
VA	Veterans Administration
YATS	Youth Attitude Tracking Survey

Chapter One

INTRODUCTION: TRENDS AND THEORETICAL CONSIDERATIONS

M. Rebecca Kilburn and Beth J. Asch

Enlisted recruiting has been difficult in recent years. In fiscal year (FY) 1999, the Army missed its recruiting target—as did the Air Force, the service long regarded as immune to recruiting difficulties. Although all the services achieved their target in FY 2000, the percentage of high-quality recruits[1] declined to its lowest level in over a decade. In part, these recent problems reflected the effects on recruiting of the unusually strong labor market and robust economic conditions. To respond to such business cycle fluctuations, the military has typically relied on such policies as higher expenditures on advertising, an increased number of recruiters, and enlistment incentives. While these policies will continue to be critical in counteracting short-term cyclical fluctuations, it is important to recognize that additional policies may be needed to respond to long-term trends. The research reported in this document informs the development of new policies that respond to two long-term trends. The first of these trends is the huge growth in college attendance in recent years. The second is the continuing growth in the use of information technology in the military and the demand for high-quality recruits. As discussed below, both trends point to the value of recruiting youth in the college market. By *youth in the college market* we mean high school youth who plan to go to college soon after completing high school, youth who are already in college, or youth who

[1] *High-quality recruits* are those who have completed high school and scored in the upper 50 percent on the Armed Forces Qualification Test (AFQT).

might have recently left college (because they have graduated or dropped out).

This report contains four chapters, each of which explores a different facet of recruiting individuals in the college market. This chapter provides background information on recent demographic trends and highlights some theoretical reasons for recruiting youth in the college-bound market. It also introduces the other chapters and clarifies their role in furthering our understanding of recruiting college-market youth.

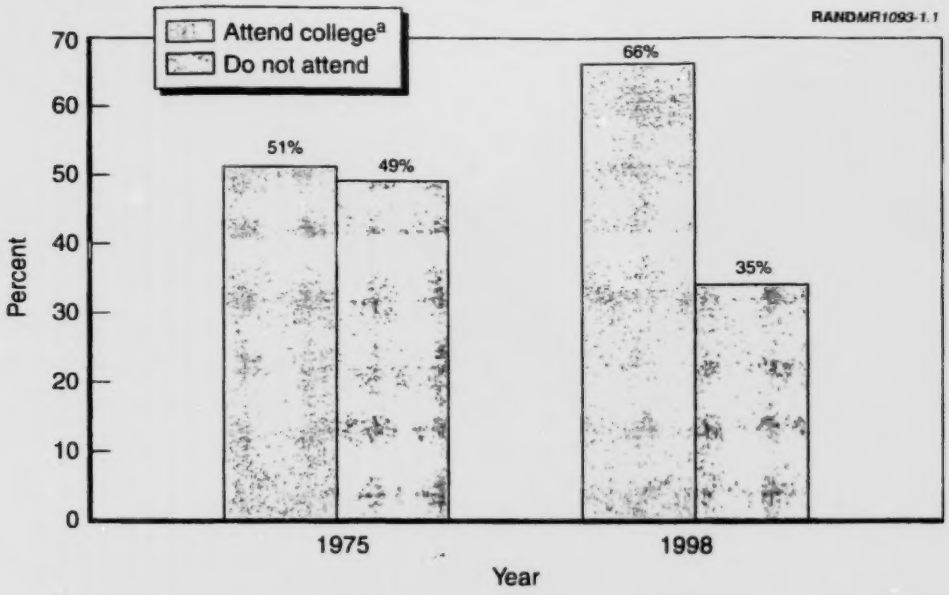
RECENT TRENDS THAT POINT TO THE RECRUITMENT OF COLLEGE-MARKET YOUTH

Growth in College Attendance

One of the fundamental long-term trends that has significance for military recruiting is the increase during the past two decades in the percentage of young people attending college. College attendance is at an all-time high. At the same time, the group traditionally targeted by military recruiters—high school graduates who do not have immediate plans to attend college—is shrinking. In 1975, around the advent of the all-volunteer force (AVF), this group comprised about half of recent high school graduates (Figure 1.1). In the intervening years, this fraction declined steadily, with the fraction of recent high school graduates who do not attend college within 12 months of graduation falling to one-third by 1998.

As discussed in greater detail in Asch et al. (1999), economists and demographers largely attribute this trend in college attendance to the growth in the college wage premium—that is, the percentage difference between the mean earnings of college graduates and the mean earnings of high school graduates. Mishel et al. (1999) found that the average college earnings premium grew from 40 percent in 1975 to 63 percent in 1998. The rapid growth in the college premium means that able young people who opt not to go to college and enter the military instead are generally forgoing a large earnings boost.[2]

[2]Although some military recruits go on to attend college after their military service, the fraction who do so is well below one-quarter (Fair et al., 2000).



SOURCE: U.S. Department of Education (1996), U.S. Department of Education (2001).

[a]Percentage of high school completers who were enrolled in college the October after completing high school.

Figure 1.1—College Enrollment of Recent High School Graduates

Since the military prefers high school graduates in AFQT categories I-IIIA,[3] a group with a particularly strong interest in college (Kilburn and Klerman, 1999), the increase in the college premium is likely to adversely affect a potential recruit's decision to enlist in the military.

Compounding the effects of the burgeoning interest in college attendance on the number of high-quality youth available for military service are the changes in the size of the overall youth population in recent years. The number of 18-year-old males in the United States declined from about 2.2 million in 1980 to about 2.0 million in 1998. This decline further lessened the supply of young men in the mili-

[3]Scoring in CAT I-IIIA implies that the individual's score was in the top half of the AFQT distribution.

tary's traditional target market: individuals who do not have immediate plans to attend college upon high school graduation. The number of young people who were not college bound within a year after high school in 1998 was about 69 percent of the number in 1980 (see Table 1.1).

Offsetting the negative effects of college interest and population changes on the size of the military's traditional recruit market is the fact that the military's accession requirement has also declined over the past decade, primarily due to the end of the cold war and the

Table 1.1

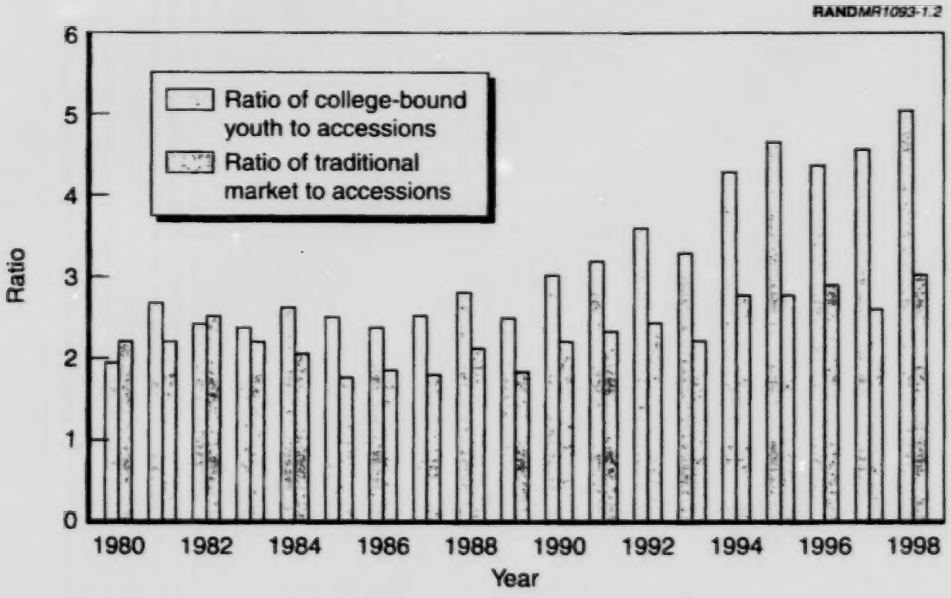
Number of Males Graduating from High School Within the Last Year, Percentage and Number Not Enrolled in College, and Number of Enlisted Accessions, by Year

Year	Males Graduating from H.S. Within Last Year (000s)	Percentage Not Enrolled in College	Number Not Enrolled in College (000s)	Enlisted Accessions (000s)
1980	1,500	53	800	361
1981	1,490	45	673	305
1982	1,508	51	769	305
1983	1,390	48	669	303
1984	1,429	44	629	305
1985	1,286	41	532	301
1986	1,331	44	587	314
1987	1,278	42	532	296
1988	1,334	43	574	271
1989	1,208	42	512	278
1990	1,169	42	493	224
1991	1,139	42	483	206
1992	1,216	40	491	202
1993	1,118	40	451	203
1994	1,244	39	490	176
1995	1,238	37	463	167
1996	1,297	40	519	179
1997	1,354	37	501	189
1998	1,452	38	552	180

SOURCE: U.S. Bureau of the Census (2000) and Office of the Assistant Secretary of Defense (2000).

downsizing of the active force. The number of individuals the military needed to recruit fell by about half from 1980 to 1998.

To assess the adequacy of the supply of non-college-bound youth, we compare the absolute number of these youth to the number of recruits needed. Because of declines in the accession requirement, this ratio has actually grown since the beginning of the decade (Figure 1.2), rising from 2.2 in 1990 to about 2.8 in 1995. Nonetheless, the growth in the ratio of college-bound youth to the accession requirement was even greater. This ratio nearly doubled during the same period whereas the ratio of non-college-bound youth to the requirement increased only about one-quarter. The difference in the growth rates of these ratios suggests that while recruiters should not abandon the traditional market, the growing college-bound market might be a rich source of recruits.



SOURCE: Authors' calculations from U.S. Bureau of the Census (2000) and Office of the Assistant Secretary of Defense (2000).

Figure 1.2—The Ratio of College-Bound Youth and Recent High School Graduates Who Are Not Attending College (Traditional Market) to Enlisted Accessions, by Year

Features of Two-Year Colleges

Two-year colleges are an important component of the college market. Nearly half of the increase in college enrollment between 1980 and 1997 was due to rising attendance at community colleges (U.S. Department of Education, 2001). Currently, about 38 percent of students enrolled in higher education attend two-year colleges (U.S. Department of Education 2001). Furthermore, the chapters of this volume largely point toward two-year college students as having more recruiting potential than four-year college students. Despite the significant role that two-year colleges play in the higher education system of the United States, policymakers are generally less familiar with the features of two-year colleges than those of four-year colleges (Kane and Rouse, 1999). The following discussion provides a brief overview of key features of two-year colleges.

Two-year colleges originally focused on preparing capable students to transfer to four-year institutions. Students typically earned an associate's degree (AA) after two years of general study and then had the option of transferring to a four-year college where they could complete their bachelor's degree (BA). Two-year colleges now have a broader mandate, often offering programs that include continuing adult education and vocational/technical programs in addition to their AA programs. In contrast to four-year students, about a third of whom are enrolled in private institutions, only about 4 percent of two-year students enroll in private colleges.

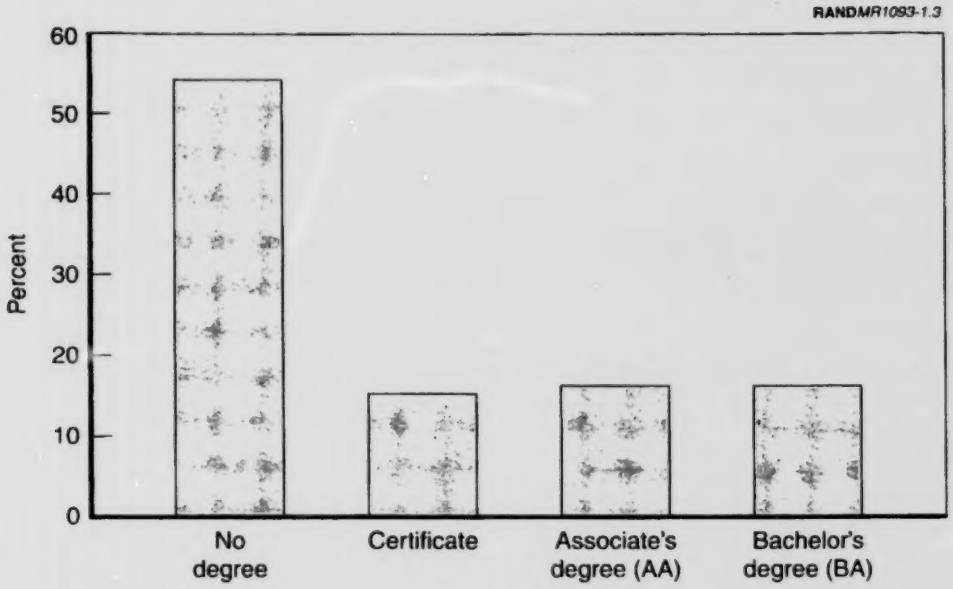
Two-year colleges attempt to expand access to higher education in three ways. First, they often have open admissions—that is, just about everyone who applies is accepted. Second, they charge relatively low tuition: Full-time tuition and fees at a two-year institution averaged around $1,700 for the 1999–2000 academic year compared with nearly $7,000 at four-year colleges (U.S. Department of Education, 2001). Third, a student can easily attend a two-year college on a part-time basis. In fact, nearly two-thirds of two-year college students attend part-time.

These features are likely to reduce the cost and increase the benefit of programs that allow individuals to combine military service and two-year college relative to programs that combine service and four-year college. Given open admissions policies, most recruits would be

eligible to attend two-year programs. In addition, paying for part or all of students' tuition would be relatively inexpensive. Finally, the flexible nature of attendance lends itself to concurrent service and school attendance. Currently, several programs do take advantage of these features to allow recruits to combine service and schooling. One is the reserves' Montgomery GI Bill program (MGIB Chapter 1606), whereby students serve in the reserves while attending college using MGIB benefits. Another is the Navy's new "Tech-Prep" program. Both of these programs partner with community colleges to enroll students in a field of study that will help prepare the student for a future military occupation. A similar program is the Navy's "CASH" program, which offers high school graduates who agree to enter a nuclear field occupation the opportunity to attend community college before enlisting and to earn basic pay while they are enrolled. The Army is also experimenting with a "college-first" program. These programs are discussed in more detail in Chapter Four.

The availability of two-year colleges varies widely by state. For example, Louisiana and Montana enroll fewer than 7 percent of college students in two-year institutions, whereas in California, nearly 50 percent of all college students are enrolled in two-year colleges. This variability is potentially important for military recruiting. As discussed in Asch et al. (1999) and later in this volume, individuals who are interested in two-year colleges are also likely to be most interested in military enlistment. In localities where options to combine two-year college and military service are limited, military enlistment may be viewed as a relatively more attractive option.

Despite offering increased access to higher education, two-year colleges often do not lead to degree completion or to a transfer to a four-year college. Over half of students who enroll in two-year colleges complete less than one year of coursework, and less than half of them obtain some type of college degree (Kane and Rouse, 1999). Among two-year students who leave school before the beginning of their second year, about half eventually return—typically to a two-year institution—and the other half never return to a postsecondary institution (U.S. Department of Education, 1998). As shown in Figure 1.3, of students who obtain a degree, about one-third attain each of the following types of degrees: certificate, AA, and BA.



SOURCE: Kane and Rouse, 1999.

Figure 1.3—Degree Attainment by 1992 of Two-Year College Students Who Matriculated in 1982

Two-year students' relatively bleak prospects of completing a degree may lead one to question why they attend these institutions. However, even for two-year college students who do not complete a degree, the labor market return to college attendance may be appreciable. In a review of studies that examined the returns to two-year college attendance, Kane and Rouse (1999) reported that several studies have estimated that each year of two-year college attendance raises annual earnings by 5 to 8 percent (Kane and Rouse, 1995, Grubb, 1995, and Monk-Turner, 1994). These figures are similar to the estimated returns to completing each year of four-year college. Furthermore, studies found that, between ages 29 and 38, the typical two-year college entrant who enrolls but does not complete a degree earns 9 to 13 percent more than the typical high school graduate with similar high school grades and test scores (Leigh and Gill, 1997, Kane and Rouse, 1995). Obtaining an associate's degree raises earnings above that for individuals who simply complete two years of college. Estimates of this incremental return to two-year degree completion

range from 8 to 19 percent (Jaeger and Page, 1996, Kane and Rouse, 1999). The much higher rate of return for women than for men is believed to largely reflect the exceptional return to nursing degrees (Grubb, 1995, Kane and Rouse, 1995).

A second reason that prospective students may find two-year colleges attractive is that two-year colleges give students who are uncertain about their educational and labor force prospects a chance to "try out" college. As discussed above, two-year colleges are relatively inexpensive, and they are amenable to part-time attendance. In fact, about 62 percent of two-year college students attend part-time, whereas only about 28 percent of four-year students attend part-time (Department of Education, 2001). Moreover, many two-year students live off-campus or with their parents and do not need to move to a new city, as is often the case for four-year students. These factors lower the cost of finding out whether they are "college material" and are well suited to attend college (Manski, 1989, Altonji, 1991). The fact that the majority of two-year students complete less than one year of coursework indicates that most two-year students find out that college is not their best alternative. In contrast, at four-year colleges, which generally require a larger cost to try out, more students go on to complete degrees. We discuss this issue at greater length below.

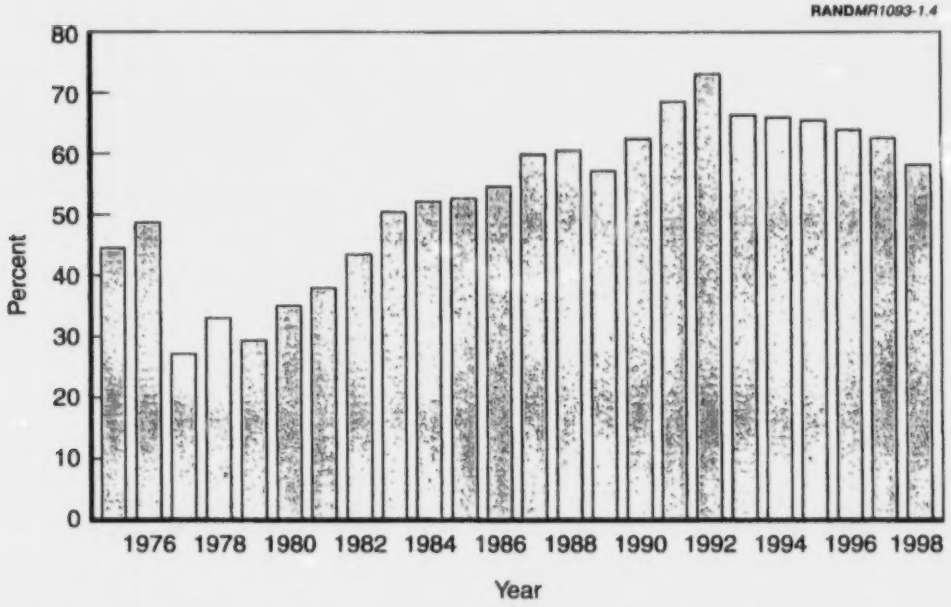
Although it is true that a large number of high-quality youth attend two-year colleges, targeting two-year college students in general would not be a productive recruiting strategy. This is because two-year college students are likely to be older and are slightly more likely to be female than the typical freshmen entering college. Only about half (52 percent) of two-year college students are under age 25, in contrast to four-year students, about 60 percent of whom are less than 25 (U.S. Department of Education, 2001). College students in general are more likely to be female than male: About 57 percent of two-year students and 55 percent of four-year students are women (U.S. Department of Education, 2001).

Increasing Demand for High-Quality Recruits in the Military

A second trend that points to the value of targeting college-bound youth is the changing nature and pace of military operations after the end of the Cold War. Operations have shifted away from preparing

for a conflict with the Soviet Union toward such activities as peacekeeping and other "operations other than war."

Personnel deployments have increased in this new environment as well (Hosek and Totten, 1998). Continuing a long-term trend that predated the AVF, the military has maintained its shift toward the utilization of high-technology methods in everything from weapon systems to procurement systems. In addition, as part of the drawdown, the services redesigned numerous career fields, requiring personnel to undertake more tasks and tasks of greater complexity (Office of the Assistant Secretary of Defense, 1998). The services maintain that these trends require recruits of increasingly higher aptitude. As Figure 1.4 shows, over the last two decades, recruit



SOURCE: Office of the Assistant Secretary of Defense (OASD), 1998 and personal communications, Accession Policy, OASD.

NOTE: High-quality accessions are those who graduated from high school and scored in the top half of the AFQT distribution.

Figure 1.4—Percentage of Non-Prior Accessions Who Were "High Quality," by Year

quality has in general risen above the quality of the recruits at the inception of the AVF. Previous research has shown that individuals of greater aptitude are more likely to be interested in attending college (Kilburn and Klerman, 1999, Kilburn, 1994). Hence, the military is likely to increasingly try to enlist college-bound individuals.

THEORETICAL REASONS FOR RECRUITING YOUTH IN THE COLLEGE MARKET

Critics of the idea of recruiting individuals in the college market sometimes make the following argument: *We're having a difficult time attracting young people who have only a high school diploma; how can we expect to attract those with some college who might have even better labor market opportunities?*

Although college-bound youth may have better civilian opportunities, which could make a given individual more difficult to recruit, targeting some of these individuals may still make sense from an efficiency standpoint. The real question is: What mix of traditional high school graduates and college-bound youth should be targeted for recruitment?

Economic theory suggests that the efficient mix of traditional and college-market recruits is the one that equalizes the marginal cost of their recruitment. Figure 1.5 shows two notional marginal cost curves, one for the traditional market and one for the college-bound market. The marginal cost curve indicates the increment in recruitment costs associated with inducing an additional youth to enter the military. Recruitment costs include the costs of the various resources used to recruit youth such as advertising, enlistment bonuses, and college benefits. The marginal cost of recruitment is assumed to vary with the number of recruits, denoted as Q on the X-axis. We assume that the curves slope upward in a convex fashion. This implies that recruiting more youth from a given market (traditional or college-bound) gets increasingly more difficult as more recruits are needed. The difficulty increases because when more recruits are needed, the military must draw into service not only those individuals with a relatively strong taste for military service but also those who have weaker tastes or even a negative taste for service. As the requirement rises, more youths with less interest in the military must be recruited.

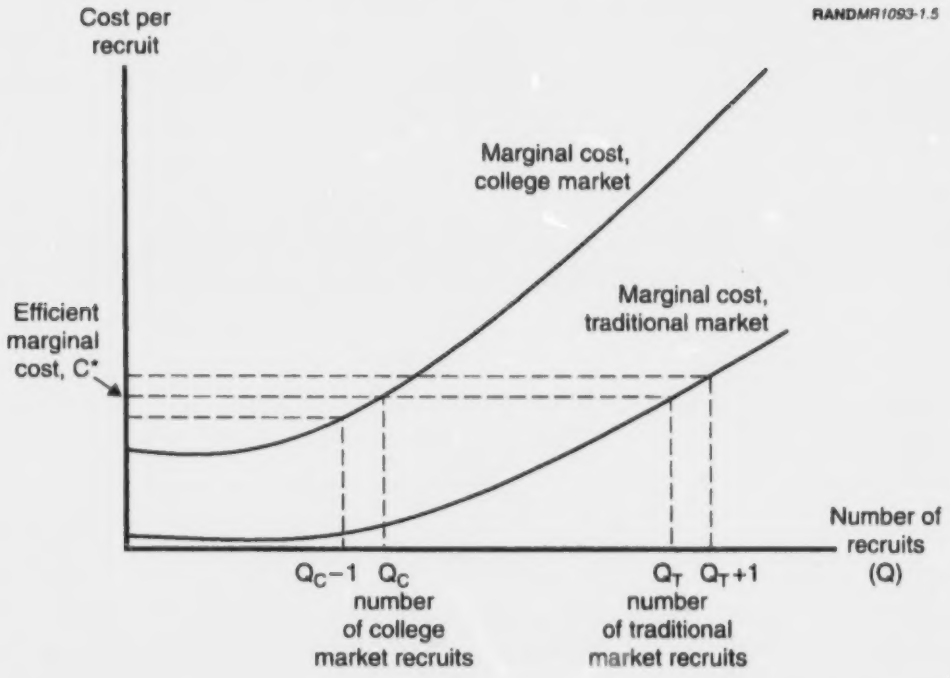


Figure 1.5—Hypothetical Marginal Cost Curves for College Market and Traditional Market

While information regarding the precise location of these curves is not available, it is likely that the marginal cost curve for the college-bound market lies above the marginal cost curve for the traditional high-school graduate market at any number of recruits, Q, because the former individuals generally have better civilian opportunities than the latter. Consequently, the recruitment of any number of youth will have a higher marginal cost if those youth come from the college market than recruiting the same number of youth, but from the traditional market. For example, recruiting Q_C number of recruits entirely from the college market would entail higher marginal costs than recruiting quantity Q_C of recruits entirely from the traditional market. The curves in the figure demonstrate that even if the marginal cost of recruiting from the traditional market is lower than the marginal cost of recruiting from the college market at a given Q, it would be most efficient to recruit from both markets rather than to recruit exclusively from the traditional market. Say the military wants

to recruit a given number of recruits, Q_N.[4] The efficient mix of college-bound and traditional youth is the level of each such that the marginal costs of each are equal (at C* in the figure) and such that $Q_C + Q_T = Q_N$.

To see why this is the optimal mix, examine the costs of recruiting Q_N but obtaining one more individual from the traditional market, $Q_T + 1$, and one less individual from the college market, $Q_C - 1$. In this case, the military could lower recruiting costs because the marginal cost of the last traditional recruit would be greater than C* whereas one more college-bound recruit would only cost C*. Hence, the optimal mix involves the recruitment of some college-bound youth despite the fact that the marginal cost curve for this group is higher than for the traditional market. However, because the marginal cost curve for the college market is above the marginal cost curve for the traditional market, the optimal mix will include more traditional youth than college-bound youth.[5]

The reason it makes sense to recruit some college-market youth despite their higher marginal cost is that the traditional market is already well penetrated. Recruiters have already tapped those in the traditional market with a strong taste for service and are forced to tap those with a weaker taste, a group that is difficult to recruit. In contrast, because the college-bound market has barely been penetrated, recruiters are more likely to find college-bound youth with a taste for military service—a group that is easier to recruit, all else equal. Hence, recruiting a combination of the traditional market and college market is likely to be less costly than recruiting everyone from the traditional market, the strategy the military has primarily relied upon in the past.

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[4]Note that it is theoretically possible that recruiting a mix of the traditional market and the college-bound market would be less efficient than exclusively recruiting from the traditional market. This would be the case if the recruiting goal, Q_N, were sufficiently low that this number could be reached on the traditional marginal cost curve at levels everywhere below the lowest point on the college-market cost curve.

[5]Our analysis does not suggest that the military should exclusively recruit from the college market. Rather, it implies that a mix of recruits from both the college market and the traditional market is desirable for DoD overall. It is possible that one or more of the services may continue to focus on the traditional market; across the services, however, it makes sense to recruit from both.

One might argue that an individual drawn from the college market could not possibly have a stronger taste for military service than a youth from the traditional market. After all, those who attend college or plan to attend college have already ruled out as an occupational choice not only the military but also civilian employment following high school. Why would they change their mind?

Decision-reversal, whereby individuals face alternatives, make a choice, then change their course of action, is a common phenomena. The decision-reversal model was originally developed in the field of economics to account for the fact that workers sometimes switched jobs (Johnson, 1978). The model can be adapted to any decision where individuals make a choice among alternatives under uncertainty and imperfect information—marriage, where to live, or whether to attend college. The common trait of these decisions is that the desirability and suitability of the choice for a particular individual cannot be completely known in advance—a person has to experience the choice in order to be able to make a fully informed decision. In the case of employment, the suitability of a job for a certain worker or that worker's abilities with respect to that job are revealed after some time on the job.

Attending college has been characterized as the type of choice whereby an individual learns about the desirability of the choice only after trying it (Manski, 1989, Altonji, 1991). Prospective students may not have complete information about how well they would like a particular school—or even if they would like college in general—until they attend. Similarly, a person may not know whether he or she is really "college material" until attending college.

Another important feature of attending college that figures into models of decision reversal is the fact that after making the choice, one can change one's mind and go back and choose one of the other alternatives. This leads to what could be called the "option value" feature of attending college: You can attend college and still leave open the option of going back and undertaking one of your other alternatives. Given that the potential payoff to college attendance is currently so high, it would be prudent for young people who are uncertain about whether they could perform well or would like college to give it a try. If they succeed, the payoff is great; if they fail, they are not much worse off because they can simply go back and

pick up one of their other alternatives (see Dixit, 1992, for a discussion of option values). In other words, military service might seem relatively more attractive to such people once they have tried college and have more information.

ORGANIZATION OF THIS VOLUME

In a previous report, *Attracting College-Bound Youth into the Military* (Asch et al., 1999), we documented demographic trends that point toward college-bound youth as a potential market that could be tapped to supplement traditional recruiting. This report further explores the recruiting potential of college-bound youth by examining in more detail features of the college-bound population and their implications for designing recruiting policies. The next three chapters examine different aspects of the college-bound youth market. Each chapter approaches the topic from the viewpoint of the young person who is making the decision to enlist or pursue some other post–high school activity. Hence, the individual decisionmaking model (see Kilburn and Klerman, 1999, and Hosek and Peterson, 1985) is the guiding principle in each of the chapters. In this model, individuals select the alternative—in this case, military enlistment, college attendance, or labor force participation—that yields the highest expected lifetime utility. This model is discussed in more detail in Chapters Two and Four.

Chapter Two, "Trends in Intentions to Enlist and Attend College," by Chris Bourg, examines the individual choice to enlist for individuals very early in the decision process. Bourg examines trends in youth's plans to attend college or enlist in the military before they have even graduated from high school, using the Monitoring the Future (MtF) data. The MtF data report the enlistment and college-going intentions of nationally representative samples of high school seniors each year between 1976 and 1995. These data permit several advances over enlistment intentions derived from another common survey of enlistment intentions, the Youth Attitude Tracking Survey (YATS). First, these data include intention questions regarding both college attendance and enlistment. Consistent with the large rise in college attendance mentioned earlier, the first portion of Chapter Two documents dramatic growth over the past two decades in the

number of high school seniors who report strong intentions to attend a four-year college after high school.

These data also enable Bourg to analyze not only the trends in college intentions over time, but also the relationship between college and military intentions. This relationship is important to understand because the implications for recruiting policy of the rising interest in college depend on the relationship between college and military intentions. If preferences for military service rise as preferences for college grow, then an increase in the fraction of youths interested in college may not be detrimental to recruiting. However, if interest in the military drops when intentions to attend college rise, then an increase in the fraction of recent graduates attending college is likely to make recruiting much more difficult. Bourg finds an inverse relationship between college intentions and military intentions, which validates the individual decision model's characterization of enlistment and college attendance as competing alternatives. Bourg also finds that the individuals most interested in the military are the least interested in attending four-year college and vice versa.

Chapter Three of this volume compares the costs of attending college for veterans and non-veterans. In terms of the individual decisionmaking model, the relative cost of attending college versus enlisting is a key factor in the choice to enlist versus to attend college. This chapter, "Paying for College: A Survey of Military and Civilian Financial Aid Programs and Postsecondary Education Costs," by C. Christine Fair, begins by examining trends in federal financial aid opportunities and military educational benefits over the past decade. The trends she identifies include some that are beneficial to recruiting: The average federal financial aid award dropped, and there has been a major shift from grant aid to loans. In terms of the individual decisionmaking model, these trends are beneficial to recruiting because they raised the net cost of nonveteran college attendance relative to military service, which would make military service relatively more attractive. Fair also observes some financial aid trends that are detrimental to recruiting: State and institutional aid grew at faster rates than college tuition, and more students received some financial aid. Again, in terms of the individual decisionmaking model, these changes made enlisting less attractive relative to attending college because they reduced the relative cost of college attendance.

Subsequently, Chapter Three investigates the fraction of college costs that military education benefit programs cover. Fair reports that the answer to this question depends largely on what type of school one is examining—public or private—and what type of costs one is considering—tuition only or total costs, which also include room and board. She finds that the College Funds go much farther toward funding a college education than the less-generous MGIB. In general, the MGIB covers all tuition costs at public schools whereas the College Funds cover total costs at public schools and about half of costs in the majority of private schools. Fair also discusses some of the interactions between different types of financial aid.

Chapter Four examines the recruiting potential of students who have already entered college. This chapter, "The Enlistment Potential of College Students," by Beth J. Asch and M. Rebecca Kilburn, discusses which segment of the college market—entrants, dropouts, or graduates from two-year or four-year colleges—has the greatest enlistment potential. The chapter uses data on individuals who entered college for the first time in 1989. These data, from the Beginning Postsecondary Students Study (BPS), followed a sample of students until 1995. Using characteristics that were found to predict individuals' enlistments in earlier studies (Kilburn and Klerman, 1999), Asch and Kilburn investigate which segment of the college market is most likely to have the characteristics associated with enlistment. They find that two-year students, and dropouts from two-year colleges in particular, are likely to be the most promising source of recruits among individuals who started college. In addition to drawing on the individual enlistment decision model, this chapter also draws on the decision-reversal model. Since this analysis examines the likelihood that individuals who initially chose to attend college would change course and enter the military, their empirical model examines factors that might lead individuals to revise their post–high school choices.

Later in Chapter Four, Asch and Kilburn examine some of the policy options available to target the college population, such as loan repayment programs, paying higher wages for more education, paying for tuition, or enlistment bonuses. They analyze these policy options from the perspective of the individual decision model outlined above to assess whether improvements could be made to the incentives aimed at this population. They find that existing programs are gen-

erally small in scale and suggest a number of ways to strengthen the programs.

In sum, recruiting strategies and policy tools used today largely resemble those devised in the mid-1970s at the advent of the AVF. Although these strategies have largely been effective at countering business-cycle fluctuations over the past two decades, the policies have not been adapted to reflect longer-term trends in both the civilian labor market and the changing nature of the military. The changes in the civilian labor market and the U.S. military have been neither subtle nor unrecognized by young people. The premium a college graduate receives in the labor market relative to a high school graduate has nearly doubled since the AVF began. Young people have responded by enrolling in college programs in record numbers despite skyrocketing college costs. In addition, the military, like the civilian sector, has increasingly incorporated technology into its workplace, leading some to predict an ever-increasing demand for advanced skills in the military.

The main point of this volume is to encourage military policymakers to recognize that the dramatic change in the civilian labor market and the military in the past two decades requires a new approach to recruiting. Designing policies to target the college market is a first step toward better aligning recruiting practices with the realities of today's labor market and today's military.

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Chapter Two

TRENDS IN INTENTIONS TO ENLIST AND ATTEND COLLEGE

Chris Bourg

INTRODUCTION

The military's increasing need for high-quality members, combined with dramatic increases in the proportion of youth who enroll in postsecondary education, indicates that the armed services must recognize two- and four-year colleges as viable competitors in the recruiting market. Nontraditional recruiting strategies designed to attract potentially college-bound youth into the military must be based on an understanding of the changing postsecondary intentions and desires of American youth. This chapter provides some of that information by describing the trends in the two-year college, four-year college, and military intentions of high school seniors from 1976 to 1995, and by estimating models of the individual characteristics associated with high school students' stated postsecondary intentions.

The research presented in this chapter shows that there has been a dramatic increase in the past 20 years in high school students' intentions to graduate from a four-year college. During that same time, students' intentions with regard to graduating from a two-year college have become more definite: The proportion of students who state that they definitely do not intend to graduate and the proportion who definitely do intend to graduate from two-year colleges have both increased since 1976. Intentions to join the military have decreased overall.

To assess the relationships among various kinds of postsecondary intentions and other individual-level predictors of intentions, multinomial logit modeling techniques were employed. This multivariate modeling method allows for the estimation of the impacts of these factors on all levels of intentions. Results obtained from this analysis indicate that students who think they probably will join the military are less likely than other students to have positive intentions to graduate from a four-year college, but more likely than others to say they probably will graduate from a two-year college. Results further show that students who definitely intend to join the military are far less likely than other students to have positive intentions to graduate from either a two- or four-year college. These results suggest that educational incentives might be effective in appealing to those students who have positive but uncertain military intentions, but less important to those who are already definite in their plans to serve.

The second section of this chapter contains a description of the general economic model of individual behavior that serves as the underlying framework for my analysis and a statement of the specific research questions addressed by this research. Previous research on both college intentions and enlistment intentions is reviewed in the third section, and in the fourth, the data used in the analysis are described. The fifth and sixth sections describe findings regarding trends in postsecondary educational intentions; the seventh describes the methods used to analyze the individual-level predictors of specific intentions. The eighth section contains a discussion of the results of this analysis, and the final section provides a summary of the main findings and general recommendations for policy and future research.

THEORETICAL FRAMEWORK AND RESEARCH OBJECTIVES

Previous research has conceptualized the general enlistment process as the result of the interaction between supply factors and demand factors (see, for example, Orvis et al., 1996; and Asch et al., 1999). Supply variables include the size and quality of the youth population; demand variables include factors under the control of the military, such as enlistment terms and recruiting quotas. Individual and ag-

gregate levels of propensity,[1] or intention to enlist, also represent important supply-side variables and have received considerable attention in the military research community. Research on individual enlistment decisions demonstrates that educational expectations are strongly associated with a preference for attending college over enlisting (see, for example, Kilburn and Klerman, 1999; and Hosek and Peterson, 1985 and 1990). This research indicates that a fuller understanding of how the intentions of high school seniors affect the supply side of the enlistment equation requires an understanding of both enlistment and educational intentions. The theoretical framework underlying much earlier work on individual enlistment intentions and decisions was derived from the general random utility model (see, for example, Kilburn and Klerman, 1999). The basic assumption of the model is that an individual faced with choices will choose the activity that yields the greatest expected utility. In other words, an individual will decide to enlist in the military if the expected utility of enlisting is greater than the expected utility of other alternatives, such as attending college or entering the civilian labor force. The utility of a particular activity for an individual is expected to be a function of various characteristics of the individual. In this chapter, this framework is applied to both college intentions and enlistment intentions.

Individual propensity, or intention to behave in a certain way, is an important predictive characteristic of individual behavior. Not surprisingly, military enlistment research has shown that an individual's stated intention to enlist in the military tends to be a strong predictor of actual enlistment (see, for example, Orvis et al., 1996; and Bachman et al., 1998). In addition, Bachman and associates (1998) analyzed longitudinal data to show that high school students' stated intentions to graduate from college are strong predictors of actual attendance and subsequent graduation. The research presented here is designed to provide information about changes in the overall

[1]In this chapter, the term *propensity* refers to an intention or expectation to engage in a particular activity. Although many previous researchers have spoken in terms of high or low propensity only, I capitalize on the full range of information available about the varying levels of propensity students have toward postsecondary education and military service. When discussing overall or aggregate propensity, I am referring to the proportion of a particular sample or subsample of interest who express a given level of propensity.

educational and enlistment intentions of high school students, as well as information about the individual characteristics associated with those intentions.

Given the well-documented racial and gender differences in the full range of postsecondary choices made by young people, this chapter focuses on identifying differences among race and gender subgroups. Although white males have historically represented the largest pool of enlistees, blacks have been overrepresented in the armed forces relative to their proportion in the overall population since the advent of the all-volunteer force. In addition, the proportion of women in the military has risen steadily over the past 20 years. In difficult recruiting times, the military has historically looked to previously underrepresented groups (most notably blacks and women) to fill shortages created by the declining size of the pool of white males (Segal et al., 1999). If this trend continues into the present recruiting crisis, it would behoove policymakers to develop an understanding of subgroup differences in enlistment intentions and potential among young people.

The following specific research question are addressed in this chapter:

1. What are the trends in postsecondary educational intentions over time for high school students in general and for race and gender subgroups?

2. What are the trends in enlistment intentions over time for high school students in general and for race and gender subgroups?

3. How do trends in educational intentions compare with trends in enlistment intentions?

4. What individual characteristics are related to educational and enlistment intentions?

5. What is the relationship between enlistment intentions and educational intentions, and how does that relationship vary with time and race/gender category?

Answers to these questions will provide the Department of Defense (DoD) with valuable knowledge regarding the role two- and four-year

colleges play as competitors for high-quality youth and will allow policymakers to design recruiting strategies based on a more complete understanding of the changing intentions of various groups of high school seniors. The next section of this chapter reviews previous research on both college and military intentions and highlights some of the ways in which the research reported in this chapter represents an important addition to existing knowledge.

PRIOR RESEARCH ON POSTSECONDARY INTENTIONS

Since the advent of the AVF in 1973, the military has sponsored an extensive amount of research aimed at understanding individual enlistment decisions. A crucial element of this research has been the analysis of data from large-scale surveys of high school students. Much of this research has focused on the propensity of youth to serve in the armed forces, analyzing variations over time and among subgroups in the youth population (see, for example, Orvis et al., 1996; Hosek and Peterson, 1985 and 1990). In addition, researchers have used longitudinal data to analyze the relationship between intentions to enlist and actual enlistment behaviors (see Orvis et al., 1992 and 1996; and Bachman et al., 1998). Relatively little research, however, has analyzed the propensity of youth to engage in other postsecondary activities. Since the choice to enter the military has been shown to be influenced by the attractiveness of other options, most notably employment in the civilian labor market and postsecondary education (Kilburn and Klerman, 1999; and Hosek and Peterson, 1985 and 1990), it follows that young people's *intentions* to enlist will likewise be related to their intentions to engage in other activities. Two unique features of the research presented in this chapter are its dual focus on postsecondary education intentions and enlistment intentions and its analysis of the relationships between them.

Postsecondary Educational Intentions

Previous research on postsecondary education has focused primarily on actual enrollment, with relatively less attention being given to analysis of intentions to enroll in postsecondary education. Regarding actual enrollment, the most consistent and relevant finding is that enrollment in postsecondary education has increased dramatically in recent years. According to the National Center for Education

Statistics, enrollment in two- and four-year colleges and universities increased by 9 percent between 1975 and 1985 and by 16 percent between 1985 and 1995 (U.S. Department of Education, 1998). Enrollment increased most rapidly among females, with the number of women enrolled in postsecondary institutions increasing by 23 percent between 1985 and 1995 while male enrollment increased by only 9 percent during the same period. In addition, the proportion of American college students who are members of racial or ethnic minorities has increased from 16 percent in 1976 to 25 percent in 1995 (U.S. Department of Education, 1998). At the same time that college attendance has risen so dramatically, the financial payoff of obtaining a college degree has also increased. In fact, the percentage difference between the real wages of a four-year college graduate and a high school graduate has increased from 40 percent in 1979 to 65 percent in 1995 (U.S. Department of Education, 1998).

Although we would expect that trends in the *intentions* of young people to enroll in postsecondary education would mirror the trends in *actual enrollment*, relatively little research has examined variations in intentions to enroll in postsecondary educational institutions. Asch and colleagues (1999) noted that the percentage of youth who want to attend graduate school has more than doubled in the past 10 years, with fewer youth claiming they want to stop their education with a two- or four-year degree. Segal and colleagues (1999) assessed temporal changes in the military intentions of high school students based on intentions to graduate from a four-year college. Their findings indicate that individuals who say they neither want to, nor intend to, graduate from a four-year college are more likely to state that they want to and/or intend to serve in the military than do those who plan to graduate from a four-year college. In addition, Bachman and associates (1998) analyzed the relationship between college intentions and college enrollment for a combined sample of high school seniors from 1984 to 1991. Their findings reveal that intentions to graduate from college stated in the senior year of high school are, not surprisingly, highly predictive of actual college enrollment. So, although prior research indicates that the total amount of education to which youth aspire has risen and that intentions to graduate from a four-year college are negatively related to military intentions and positively related to college enrollment, we do not yet have research indicating overall trends in the postsecondary educa-

tion *intentions* of high school students. More specifically, very little research analyzes trends for two-year colleges and four-year colleges separately. The research presented in this chapter fills that gap by describing trends in high school students' stated intentions to graduate from two-year and from four-year colleges.

Military Intentions

Research on the enlistment intentions of young people is much more abundant than research on their postsecondary educational intentions. The primary survey used by DoD to assess youth interest in serving in the military is the YATS.[2] Two primary types of propensity measures are assessed in the YATS. The measure with the strongest likelihood of predicting actual enlistment is *unaided mention*. Youth are said to make an unaided mention of propensity when they respond with plans of joining the military to the open-ended question "What do you think you might be doing in the next few years?" The most common other measure of propensity is derived from respondents' answers to the more direct question: "How likely is it that you will be serving on active duty in the Army (or Navy, Air Force, or Marines) in the next few years?" Response choices are "Definitely," "Probably," "Probably not," and "Definitely not." Youth who state they either Definitely or Probably will serve are considered to have positive propensity. The most widely known measure of propensity is the "active composite propensity," which defines respondents as having positive propensity if they express an intention to serve in any of the four services listed.

Analyzing recent trends in propensity based on the YATS' "active composite propensity" measure, Orvis and colleagues (1996) noted that there was a modest increase in positive propensity from 1989 through 1992, followed by a decline from 1992 to 1993 and a second decline from 1995 to 1996. Using a similar measure from the MtF surveys, Segal and colleagues (1999) noted that there has been a proportionally large decrease since 1976 in the percentage of youths who state they Definitely Will serve in the military. They also reported a slight decrease in those who say they Probably Will, a

[2]Both the YATS data and the MtF data are discussed in more detail later in the chapter.

marked decrease in those saying they Probably Won't, and a dramatic increase in the proportion who say they Definitely Won't serve in the military. They concluded that there has been a downward shift in the percentage of high school students who are undecided about military service, with the net resolution in the direction of not intending to serve.

Analyses of both the YATS and MtF data regarding trends in military intentions yield quite similar findings: There has been a general decline in the propensity of youth to serve in the military in the past 20 years. However, findings regarding the relationship between intentions stated in YATS surveys and enlistment behavior differ markedly from findings regarding the relationship between MtF intentions and enlistment. Analyses of YATS data from 1984 to 1993, matched with actual enlistment records, reveal that almost 35 percent of male youth who made unaided mention of a propensity to serve in the military had actually enlisted within four years. Of those who did not make an unaided mention but indicated a positive propensity (stating they either Definitely Will or Probably Will serve in one of the armed services), nearly 15 percent actually enlisted. Finally, approximately 5 percent of youth with negative propensity ended up enlisting (Orvis et al., 1996).

Although these figures indicate that YATS propensity data are strongly predictive of actual enlistment behavior, analyses of the longitudinal MtF data indicate that propensity as measured in MtF surveys is even more predictive of actual behavior (Bachman et al., 1998). The MtF surveys do not include an unaided mention measure, so MtF propensity data are primarily based on a measure similar to the YATS "active composite propensity" measure. In an analysis of MtF surveys from 1984 to 1991, Bachman and colleagues (1998) found that 70 percent of male respondents who stated they Definitely Will serve had enlisted within six years of high school graduation. Thirty percent of those who said that they Probably Will enlist had also done so. Only 10 percent of the young men who said they Probably Won't serve had actually enlisted, and less than 6 percent of those who stated they Definitely Won't serve had actually enlisted within six years of graduation.

Analyses of YATS data also provide a different picture regarding which propensity groups account for what proportion of enlistees.

According to YATS analyses, the negative propensity group (those stating they Definitely Won't or Probably Won't serve) is so large that they account for nearly 50 percent of all enlistees, in spite of their lower enlistment rate (Orvis et al., 1996). Analysis of MtF data shows that the majority of enlistees come from the positive propensity group, with the group stating they Definitely Will serve accounting for almost 50 percent of young male enlistees. Those who state they Probably Will account for approximately 25 percent of enlistees, and the remaining 25 percent are drawn from the negative propensity group (Bachman et al., 1998). It is important to note, however, that even in the MtF analysis, almost 50 percent of all enlistees come from groups of students who are not definite about their military plans.

One of the main explanations for the different findings regarding the relationship between military propensity and actual enlistment is that the YATS and MtF data are collected from different samples of young people. YATS samples include youth aged 16 to 24 but exclude those beyond their second year of college and those who have already enlisted in the military. The MtF sample includes only youth in their senior year of high school, who are surveyed approximately two months prior to high school graduation. The YATS sample, therefore, includes many younger respondents whose plans are likely to be far less firm than the plans of the high school seniors who make up the MtF sample. These differences in the sampling frames not only yield different results, but also indicate that data from the two surveys might best be suited for different purposes. The YATS data, however, might be better suited for analyses of attitudes toward military service prior to the point of firm expectations, with the possible aim of identifying potential recruiting targets and designing strategies to influence initial attitudes in the direction of positive propensity to serve. The MtF data are clearly better suited for estimating temporal trends and individual level predictors of relatively firm plans, and for demonstrating how strong the relationship between propensity and enlistment can be (Bachman et al., 1998).

Because one of the main goals of this chapter is to describe recent trends in both postsecondary education intentions and military intentions, the MtF data are most appropriate. These data allow for the estimation and comparison of trends in what can be considered the fairly firm intentions of high school seniors. It is important to note, however, that even at the time of the MtF surveys many students ex-

press less-than-definite plans about pursuing particular activities. For example, the 1995 MtF data indicate that over 20 percent of youth have indefinite intentions regarding military service (stating either that they Probably Will or Probably Won't serve), and over 40 percent of youth are not definite about their plans for attending either a two-year or a four-year college. Since even these uncertain youth must eventually decide to pursue some postsecondary activity, they may represent a potentially fruitful recruiting market for DoD. This chapter assesses trends in each level of college and military intentions and employs multivariate methods that estimate the impact of various predictors separately for each level of intentions. This choice of methods provides results describing trends in the size and composition of this pool of potential recruits. The next section describes the MtF data used in this analysis in more detail.

DATA FROM MONITORING THE FUTURE

Monitoring the Future (MtF) is an ongoing study of high school students conducted by the Institute for Social Research at the University of Michigan. The primary purpose of MtF is to study changes in the beliefs, attitudes, and behaviors of young people in the United States. Although results of MtF research are primarily used to monitor trends in substance use and abuse among young people, the surveys contain many questions about other types of beliefs, attitudes, and behaviors. Of particular interest for the purposes of this chapter are the questions regarding the postsecondary intentions of the survey respondents.

For this research, data from the yearly surveys administered to nationally representative samples of high school seniors from 1976 to 1995 are analyzed. Each year, the samples are selected using a multistage random sampling procedure. In Stage 1, particular geographic areas are selected. In Stage 2, one or more schools in each area is selected, with a probability of selection proportionate to student-body size. In Stage 3, classes within each school are selected. Sample weights are provided for use in analysis in order to correct for unequal probabilities of selection at any stage of sampling.

The data from students are collected during the spring of each year, approximately two months prior to graduation. In most cases, the survey questionnaires are group-administered in classrooms during

a normal class period. Because the survey contains the same questions each year, the MtF data are ideally suited to analyzing changes over time in the attitudes and behaviors of high school seniors.

Each year, the Monitoring the Future survey asks high school seniors about their postsecondary intentions. Specifically, respondents are asked: "How likely is it that you will do each of the following things after high school?" The following five activities are listed:

- Attend a technical or vocation school
- Serve in the armed forces
- Graduate from a two-year college
- Graduate from a four-year college
- Attend graduate or professional school after college.

Respondents select Definitely Won't, Probably Won't, Probably Will, or Definitely Will for each activity. The proportion of students in each response category for each activity is used to assess trends in the aggregate intentions of high school seniors over time. In order to focus on high-quality youth, the analysis in this chapter is restricted to those students who state they will graduate from high school. Ideally, the analysis would also be restricted to individuals who score, or have a high probability of scoring, in the top half of the AFQT distribution. Unfortunately, however, the MtF data contain neither AFQT scores nor appropriate predictors of AFQT scores.

The findings regarding the trends in two-year and four-year college intentions of high school students are presented and discussed in the following section. In general, the findings suggest a modest increase in positive propensity to graduate from a two-year college and a dramatic increase in positive propensity to graduate from a four-year college. Differences among race and gender groups are also discussed. Given the results in Bachman et al. (1998) regarding the strong correspondence between graduation intentions and actual enrollment, we assume that individuals in the MtF who stated they intend to *graduate* from a two-year or four-year college also intend to attend two-year or four-year colleges.

TRENDS IN POSTSECONDARY COLLEGE INTENTIONS

Background

From the perspective of a general random utility model of individual behavior, previously cited research on college intentions indicates that the utility of choosing college has increased dramatically over time, which should lead to increased propensity to attend college as well as increased attendance.

Based on the trends and perspectives outlined in previous sections of this chapter, we would expect the intentions of high school seniors to attend either a two-year or a four-year college will have risen over time. The attendance trends further suggest that the postsecondary intentions of females and minorities will have increased more than will have the intentions of males and white students. We would expect that the proportion of students who say they Definitely Will or Probably Will graduate from a two-year or four-year college to have increased over time, and the proportion who say they Definitely Won't or Probably Won't to have decreased. We would further expect that the largest increases in positive intentions (Definitely or Probably Will) and that the largest decreases in negative intentions (Definitely Won't or Probably Won't) will be among women and nonwhites.

Results: Two-Year College Intentions

Results of the analysis of trends in two-year college intentions are presented first, followed by results of the analysis of trends in four-year college intentions. In order to assess differences in intention trends by race and gender, results are presented for the total sample, as well as separately by race and gender. White males account for approximately 43 percent of the sample, black males make up approximately 5 percent of the sample, white females account for 46 percent of the sample, and black females represent approximately 6 percent of the sample.[3]

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[3]These figures differ from the proportions of each group in the national population because of the underrepresentation of African Americans among high school seniors.

Overall Trends. We look first at two-year college intentions. Figure 2.1 shows the proportion of high school students who say they Definitely Will, Probably Will, Probably Won't, and Definitely Won't graduate from a two-year college, by year.

As expected, Figure 2.1 reveals a significant increase over time in the proportion of high school seniors who say they Definitely Will graduate from a two-year college. In fact, the increase from 11 percent in 1976 to 16 percent in 1995 represents a nearly 50 percent rise in the proportion of high school students who say they Definitely Will graduate from a two-year college. Interestingly, the proportion who say they Definitely Won't graduate from a two-year college also increased, although by only about 10 percent—from 38 percent in 1976 to 42 percent in 1995. As we will see in the figures for four-year college intentions, this may reflect in part an increase in the certainty of attending four-year institutions rather then two-year institutions. The proportion of students who say they Probably Won't graduate from a two-year college decreased nearly 30 percent, from 31 percent

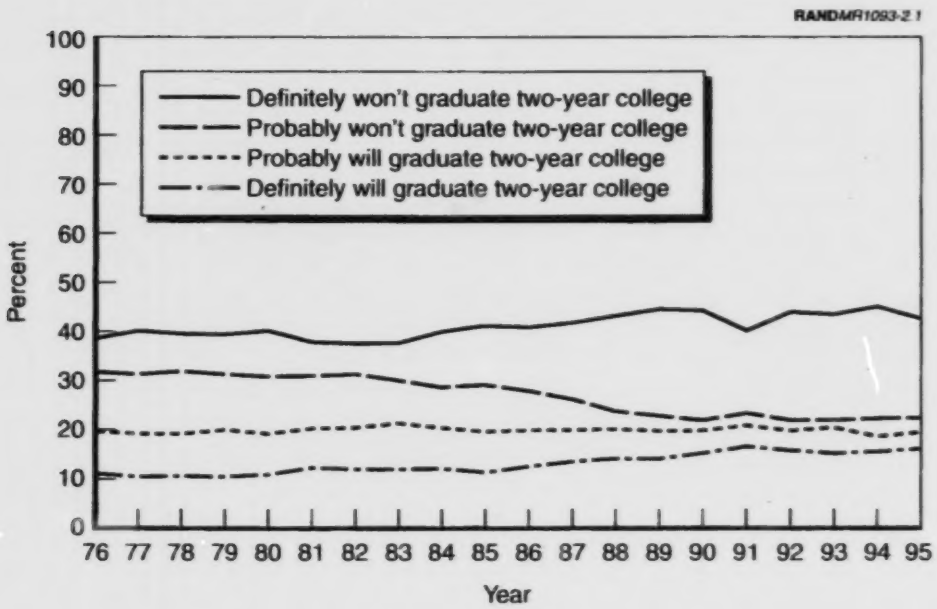

Figure 2.1—Two-Year College Intentions by Year, Total Sample (N = 260,249)

to 22 percent. At the same time, the proportion who state they Probably Will did not change significantly between 1976 and 1995.

Overall, these results indicate that the main trend in two-year college intentions over time has been an increase in the certainty of high school seniors' intentions to graduate from a two-year college.

Trends by Race and Gender. Figures 2.2 through 2.5 show trends in two-year college intentions for specific race[4] and gender categories. Figures 2.2 and 2.3 reveal that the changes in the two-year college intentions of white males and white females resemble the changes in high school seniors as a whole (see Figure 2.1).

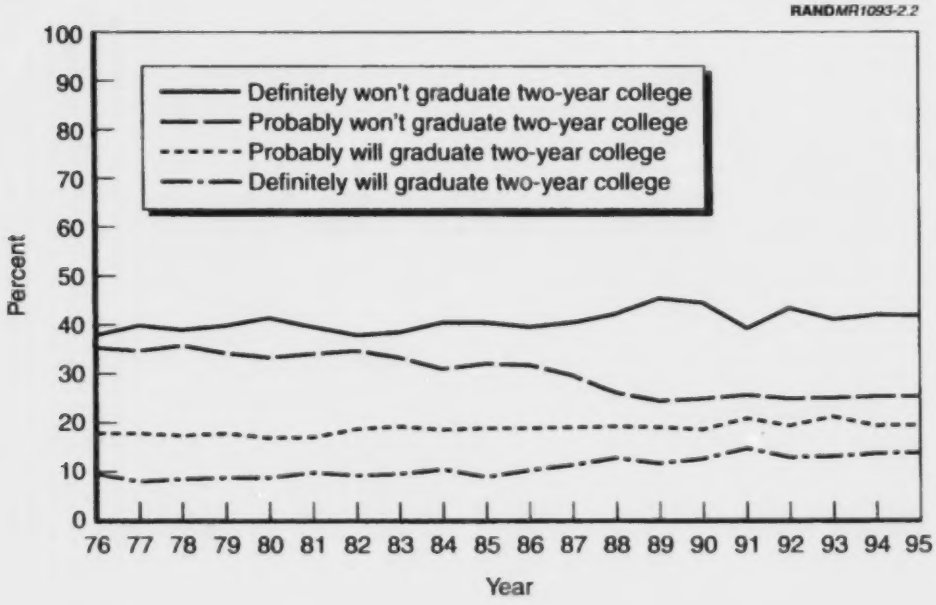

Figure 2.2—Two-Year College Intentions by Year, White Males (N = 110,116)

[4]The measure of race available in the MtF data is limited to the two largest racial categories: white and black. Although more accurate and exhaustive measures of racial and ethnic identity would be extremely useful to this analysis, the limitations of the data restrict us to the dichotomous measure of race available in the MtF.

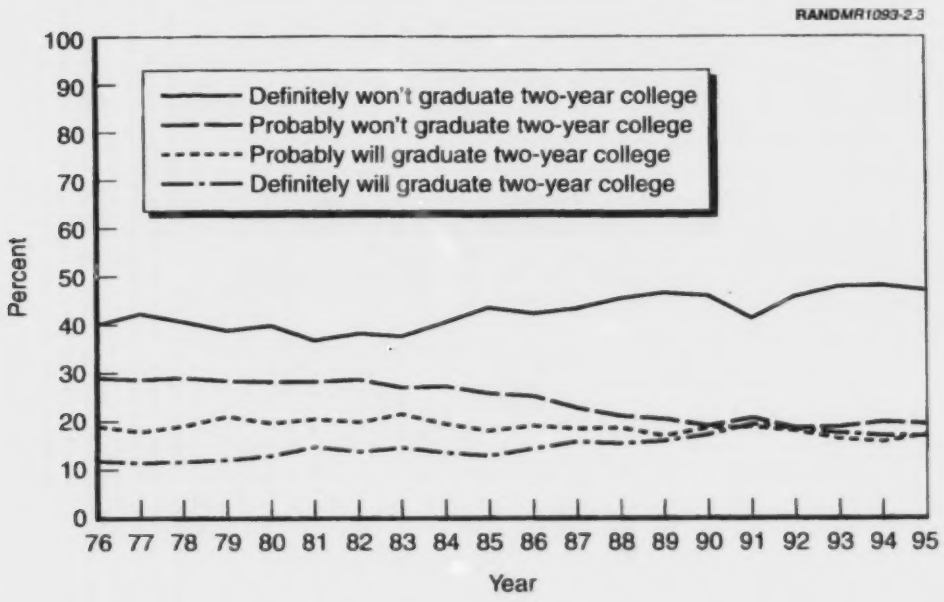

Figure 2.3—Two-Year College Intentions by Year, White Females (N = 115,813)

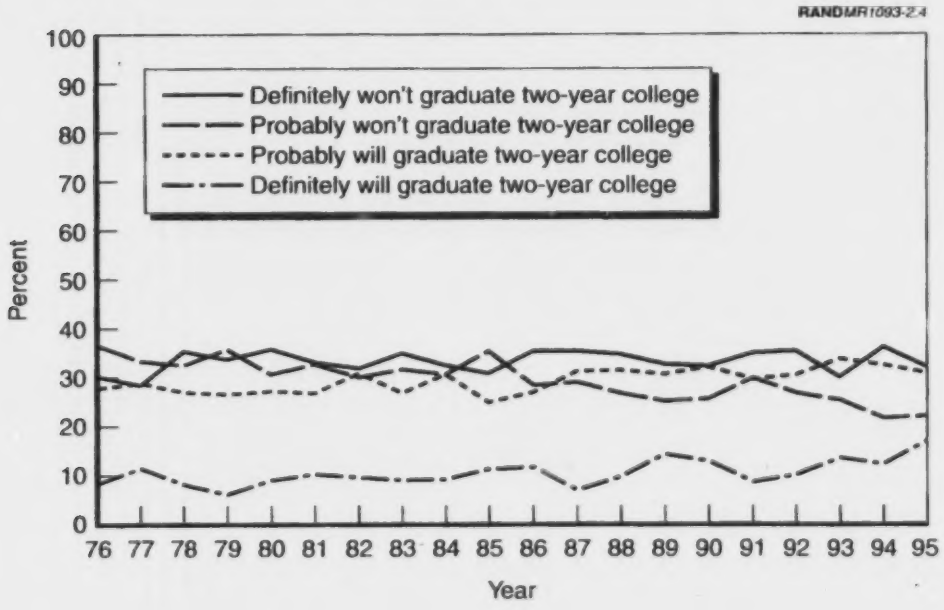

Figure 2.4—Two-Year College Intentions by Year, Black Males (N = 14,767)

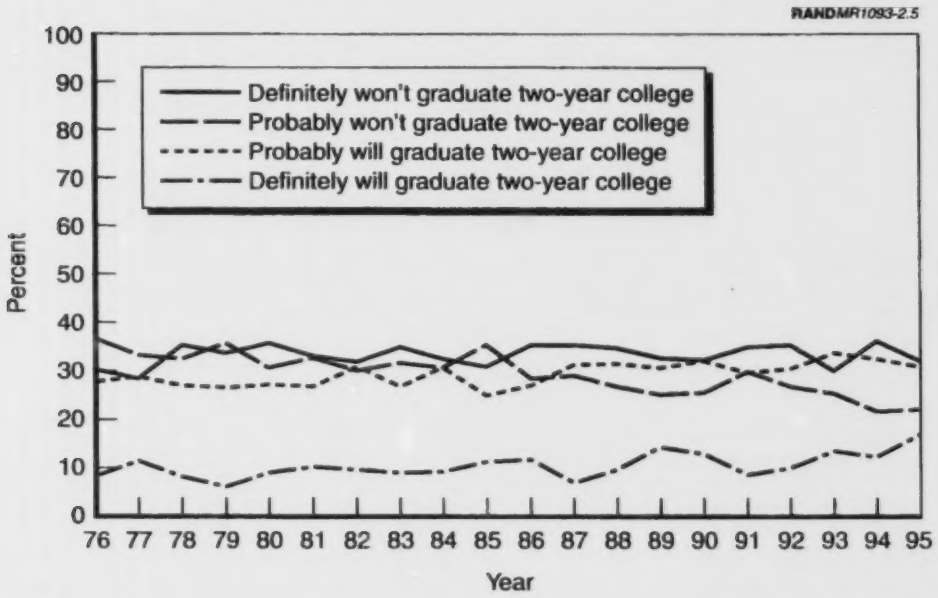

Figure 2.5—Two-Year College Intentions by Year, Black Females (N = 19,957)

Figures 2.4 and 2.5 reveal racial differences in the aggregate two-year college intentions of high school seniors. Most notably, we see that black males (Figure 2.4) and black females (Figure 2.5) are more evenly distributed across response categories than are their white counterparts. This is primarily due to higher proportions of blacks than whites in the Probably Will category and lower proportions in the Definitely Won't categories.

The propensity to graduate from a two-year college has risen the most and is currently highest among black males. Looking at Figure 2.4, we see that the proportion of black males who say they Definitely Will graduate from a two-year college has doubled, rising from 8 percent in 1976 to 17 percent in 1995. This is the largest absolute and relative increase of the four race-gender groups. It is also interesting to note that in 1995, the proportion of black men who said they Probably Will graduate from a two-year college (approximately 30 percent) is essentially the same as the proportion who said they Definitely Won't. For all other race-gender groups, the proportion of

students who said they Definitely Won't is clearly larger than all other categories.

Summary of Two-Year College Trends. The data presented here on the trends in intentions to graduate from a two-year college indicate that high school seniors have become more definite about their plans in regard to two-year colleges, as indicated by increases over time in the proportion of students stating they either Definitely Will or Definitely Won't graduate from a two-year college. Although there has been an increase over time in positive propensity to graduate from a two-year college for all groups, the increase has been especially steep among black males. The overall increase in positive propensity to graduate from a two-year college, while modest, is consistent with the idea that the individual utility of higher education has increased as the financial returns to education have increased. This trend is reflected even more clearly in the findings regarding the trends in intentions to graduate from a four-year college, which are presented in the next subsection.

Results: Four-Year College Intentions

Overall Trends. Turning to trends in intentions to graduate from a four-year college, Figure 2.6 shows aggregate changes over time for high school seniors as a whole. As expected, it shows that there has been a large increase (from 29 percent in 1976 to 57 percent in 1995) in the proportion of high school seniors who say they Definitely Will graduate from a four-year college. The data also reveal a correspondingly large decrease (from 28 percent to 10 percent) in the proportion of students who say they Definitely Won't graduate from a four-year college, and in the proportion who indicate they Probably Won't (from 19 percent to 11 percent). Focusing on relative changes, we see that the proportion of students who say they Definitely Will graduate from a four-year college has doubled, whereas the proportion who say they Definitely Won't has fallen by nearly two-thirds, and the proportion who say they Probably Won't has decreased by nearly half. The proportion of high school seniors who say they Probably Will graduate from a four-year college has remained relatively stable over the past 20 years, with approximately 20 percent of students falling into this category each year.

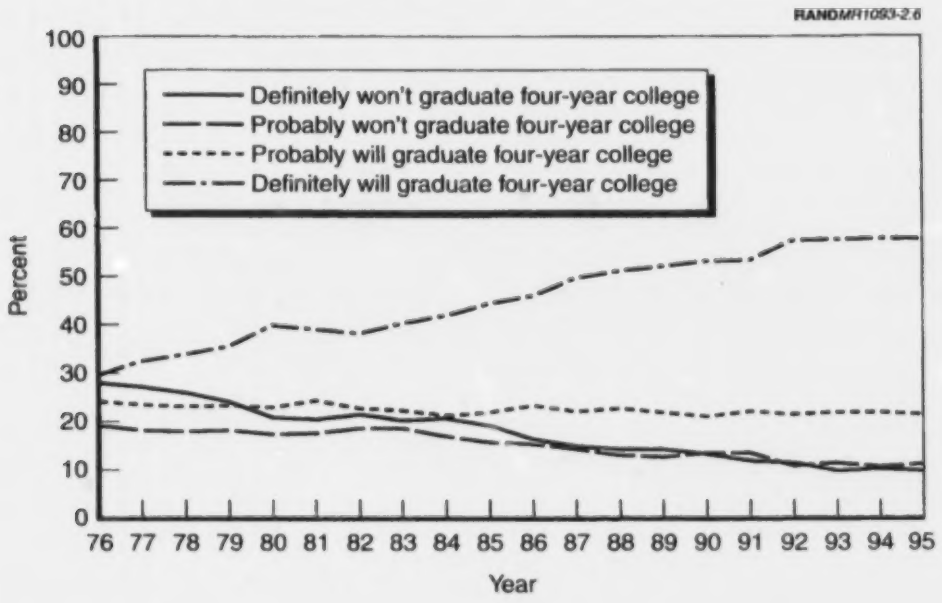

Figure 2.6—Four-Year College Intentions by Year, Total Sample (N = 265,096)

Overall, the main trend in four-year college intentions is an increase in positive intentions to graduate from a four-year college. The large steady increase in the proportion of students who Definitely Will graduate from a four-year college, combined with the large decrease in those who Definitely Won't, provides support for our expectation of an overall increase over time in positive propensity to graduate from a four-year college.

Trends by Race and Gender. Figures 2.7 and 2.8 reveal that the trends among white males and white females resemble the overall group trends, which is not surprising since white students make up almost 90 percent of the sample.

In addition, while the other groups have experienced a nearly two-thirds decrease in the proportion who say they Definitely Won't graduate from a four-year college, the proportion of black males who say they Definitely Won't graduate from a four-year college has decreased by only one-half (from 20 percent to 11 percent). Although this is a large absolute decrease, it is the smallest relative decrease

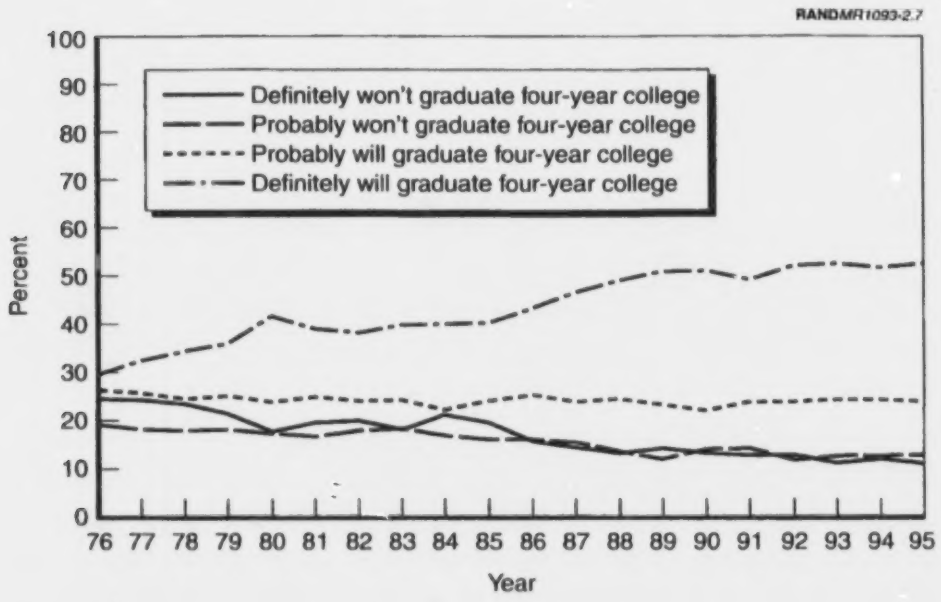

Figure 2.7—Four-Year College Intentions by Year, White Males (N = 112,727)

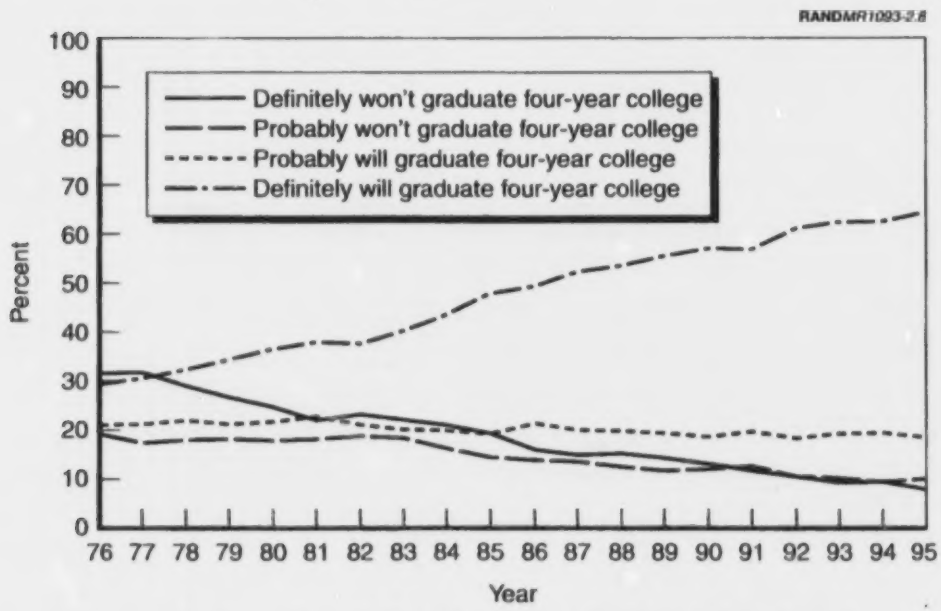

Figure 2.8—Four-Year College Intentions by Year, White Females (N = 116,983)

among the race-gender groups. In contrast, we saw in Figures 2.1 through 2.5 that the proportion of students who say they Definitely Won't graduate from a two-year college has increased slightly for all groups except black males, among whom the proportion has remained relatively stable.

Turning to trends among black students, Figures 2.9 and 2.10 show that the relative increases in the proportions of black students who say they Definitely Will graduate from a four-year college have been somewhat lower than for white students. Among black men, there has been a 74 percent increase (from 27 percent in 1976 to 47 percent in 1995), and among black women there has been a 50 percent increase (from 40 percent to 60 percent) in the proportion of students who say they Definitely Will graduate from a four-year college.

Figure 2.10, which looks at race and gender patterns in the absolute proportions of students having different four-year college intentions, reveals that in 1976, 40 percent of black females said they Definitely

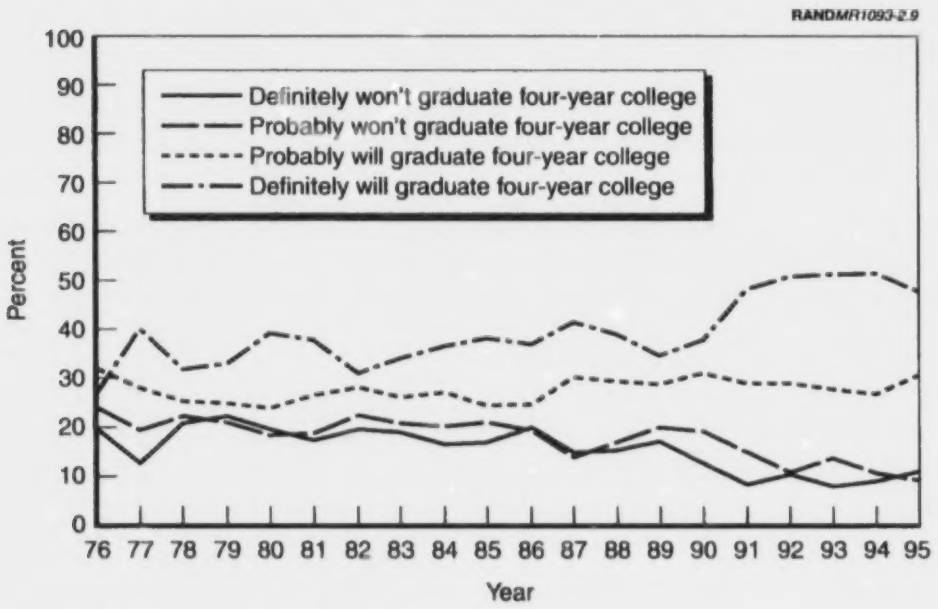

Figure 2.9—Four-Year College Intentions by Year, Black Males (N = 15,130)

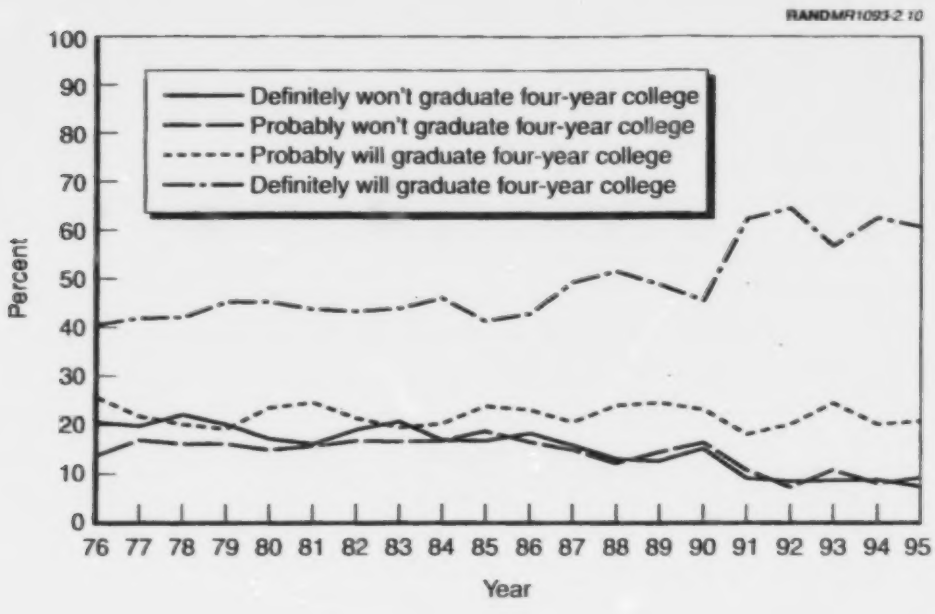

Figure 2.10—Four-Year College Intentions by Year, Black Females (N = 20,256)

Will graduate from a four-year college. This was the highest proportion among all the race/gender groups. In other words, black females began the 20-year period with a higher proportion in the Definitely Will group than did their male counterparts or white students of both genders. By 1995, over 60 percent of both black and white women said they Definitely Will graduate from a four-year college, with 52 percent of white men and 47 percent of black men saying the same.

Summary. Overall, these results indicate that there has been a dramatic increase over time in the aggregate intentions of high school students to graduate from a four-year college. The large increase in the proportion of students who say they Definitely Will graduate from a four-year college, along with the decrease in the proportion who state they Definitely Won't, is the strongest indicator of this trend. In contrast, the analysis of two-year college intention trends reveals that the proportion of students who state they Definitely Will *and* the proportion of students who state they Definitely Won't graduate from a two-year college have both increased in the past 20 years.

To understand how the trends in both two-year and four-year college intentions might affect and interact with the military recruiting market, an analysis of overall trends in intentions to serve in the armed forces is needed. The next section presents an analysis of military enlistment intentions and compares the results with the educational intentions results just discussed.

TRENDS IN MILITARY ENLISTMENT INTENTIONS

Background

Previous analysis of these data (see Segal et al., 1999), as well as analyses of data from the YATS (for a recent review, see Orvis et al., 1996), indicates that there has been an overall decline in positive propensity to serve in the military over the past twenty years. A number of explanations have been offered for this decline, including the possibility that the individual utility of serving in the military has declined relative to the rising utility of pursuing a college education (Asch et al., 1999; Kilburn and Klerman, 1999). In order to compare trends in college intentions with trends in military intentions, I analyze trends in intention to serve in the military for high school seniors as a whole, as well as for subgroups by race and gender. Results of that analysis, which replicate the results presented by Segal and colleagues (1999), are presented below.

Results: Military Enlistment Intentions

Overall Trends. Figure 2.11 displays the trends in military intentions over time for high school seniors as a whole. The most notable trend is the large increase in the proportion of students who say they Definitely Won't serve in the military. The percentage of high school students who indicated they Definitely Won't serve in the military rose from 57 percent in 1976 to 74 percent in 1995, a relative increase of nearly 30 percent. During the same time period, the proportion of students who said they either Probably Will or Probably Won't serve in the military decreased. The decrease in the Probably Won't category, from 29 percent in 1976 to 17 percent in 1995, was especially large (almost a 40 percent relative decline). It appears that much of the growth in the Definitely Won't category may be due to a

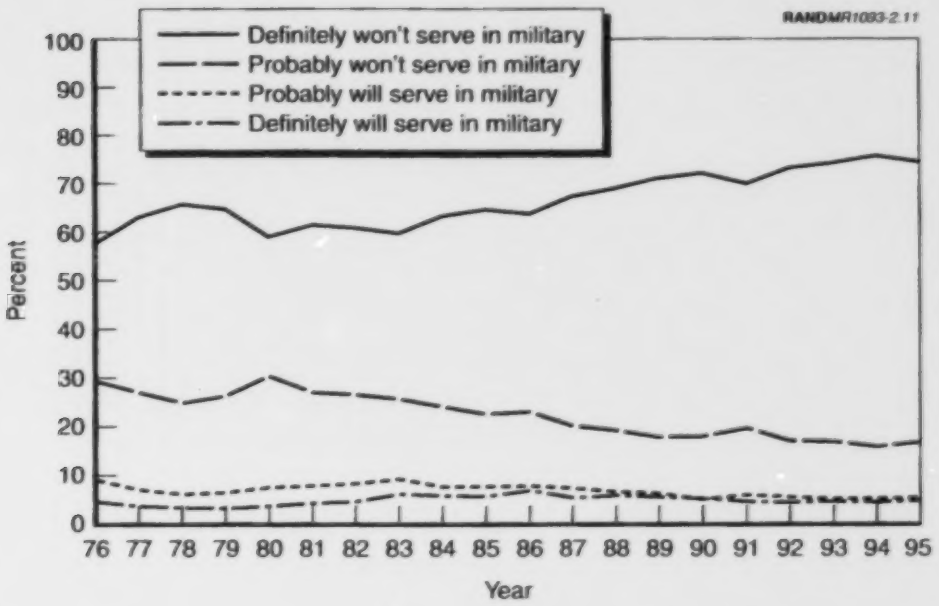

Figure 2.11—Military Intentions by Year, Total Sample (N = 255,338)

corresponding decline in the Probably Won't group. In other words, although the proportion of students with negative propensity (the sum of those who say they either Definitely Won't or Probably Won't serve) has risen only slightly since 1976 (from 86 percent to 91 percent), this group is increasingly dominated by students who say they Definitely Won't enter the military, while fewer students are stating they Probably Won't. It appears that students with negative propensity are increasingly more likely to be definite about it.

The proportion of students who state they Definitely Will serve in the military remained relatively small over time, reaching a high of 7 percent in 1986. The increase from 4.5 percent in 1976 to 7 percent in 1986, along with a decrease to 5 percent by 1995, represents large relative changes and indicates declining propensity since the mid-1980s. In addition, the proportion of students who say they Probably Will join the military fell from 9.1 percent in 1976 to 5.3 percent in 1995, a relative drop of over 40 percent.

In sum, the main trends in military intentions indicate an overall decrease in positive intentions toward military service with a corresponding increase in firm negative intentions to join the military.

Trends by Race and Gender. Figure 2.12 reveals that the military intention trends among white males mirror the trends among high school students as a whole. The proportion of white men who stated they Definitely Will serve in the military rose from 6 percent in 1976 to a high of 11 percent in 1986, then dropped again to approximately 7 percent in 1995. At the same time, the proportion of white men who say they Probably Will join the military dropped by 41 percent, from 12 percent in 1976 to 7 percent in 1995. The proportion of white men who state they Probably Won't join the military dropped even more precipitously, from 40 percent to 25 percent—a relative decline of nearly 40 percent. The proportion who state they Definitely Won't join the military rose by one-third, from 41 percent to 62 percent.

Figure 2.13 shows the enlistment intention trends for white females. White female students have the highest percentage stating they

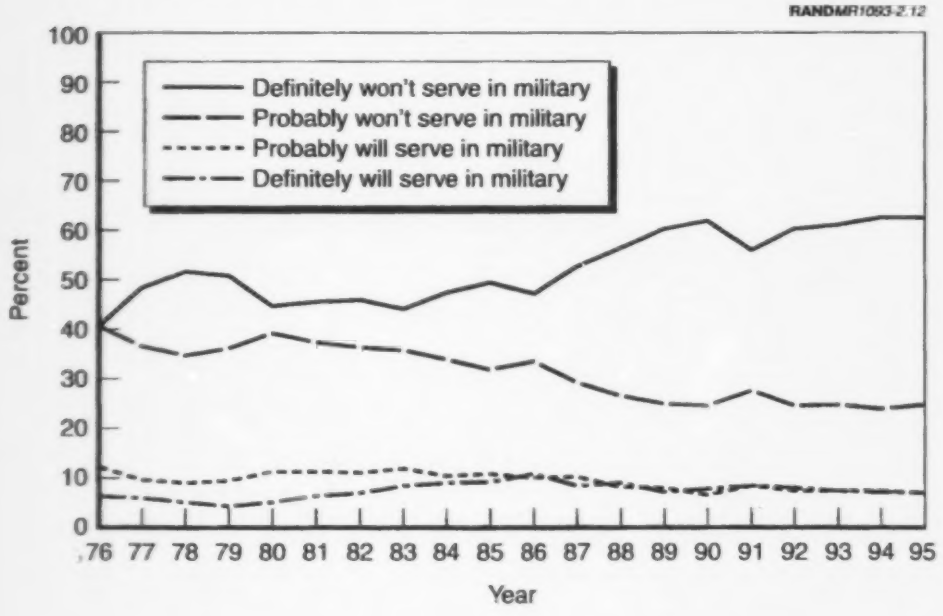

Figure 2.12—Military Intentions by Year, White Males (N = 108,207)

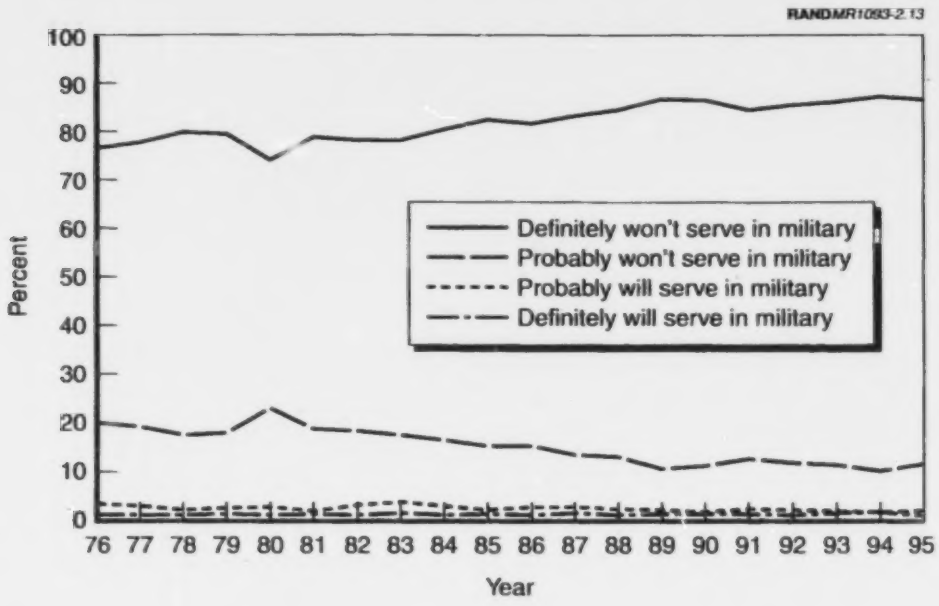

Figure 2.13—Military Intentions by Year, White Females (N = 113,952)

Definitely Won't join the military (over 85 percent in 1995), and the lowest percentage saying they Definitely Will (less than 1 percent in 1995). Furthermore, although the direction of change in each intention category is the same for white women as for the whole group, the magnitude of the changes is relatively small among white females.

Figure 2.14 reveals that trends in the military intentions of black males have been somewhat different from the trends among white males. The first difference is that, through much of the 1980s, the proportion of black males in each response category was approximately equal, while for all other groups a clear majority of students stated they Definitely Won't join the military in every year of the survey. Additionally, with the exception of the mid- to late 1980s, the proportion of black male respondents who stated they Definitely Will serve in the military has been less stable than for the other groups. From 1983 to 1989, the proportion of black men who stated they Definitely Will serve in the armed forces hovered around 25 percent. That percentage dropped to 10 percent in 1995 (a relative decline of

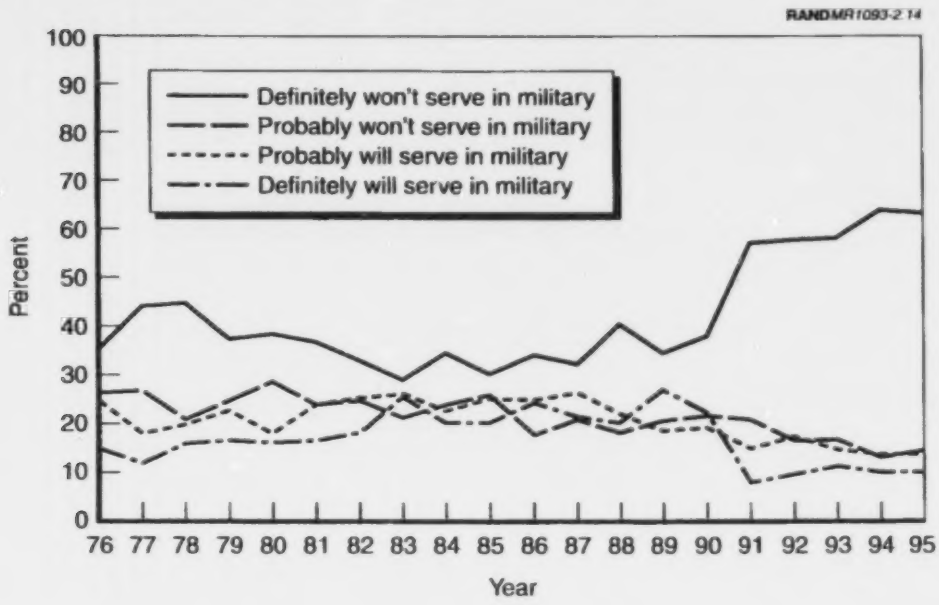

Figure 2.14—Military Intentions by Year, Black Males (N = 14,247)

60 percent), still the highest percentage of the race/gender groups analyzed. Finally, there has been an especially steep increase since 1990 in the proportion of black males who state that they Definitely Won't serve.

Between 1990 and 1995, the proportion of black males who stated they Definitely Won't serve in the military rose from less than 40 percent to nearly 60 percent. This finding is consistent with other reports of declining black male propensity in the 1990s (see Orvis et al., 1996; and Segal et al., 1999), as increasing proportions of black males are rejecting the idea of military service.

Figure 2.15 reveals that there is less difference in the proportion of students in the Probably Will, Probably Won't, and Definitely Will category for black women than for white women or white men. Note that the proportion of black females who state they Definitely Won't join the military decreased from 82 percent in 1994 to 74 percent in 1995. Black females are the only group to show a decrease in this category in this latest year of the survey.

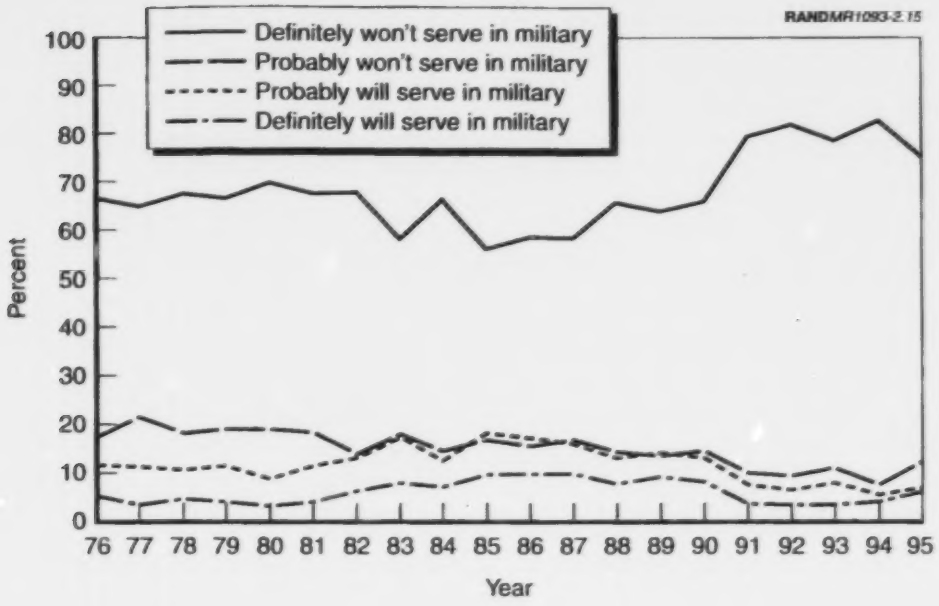

Figure 2.15—Military Intentions by Year, Black Females (N = 18,932)

Summary. Overall, the data indicate that high school seniors' intentions to serve in the military have fallen over the past 20 years. The proportion of students who state they Definitely Won't serve in the military has risen steadily during that time, while decreasing percentages of students say they either Probably Will or Probably Won't serve. In addition, since the mid-1980s for white men and since the late 1980s for black males, the proportion of students who state they Definitely Will join the military has declined sharply.

Comparison of Trends in College and Military Intentions

Comparing trends in military intentions to the trends in two-year and four-year college intentions, we see some similarities in the military and two-year college trends, whereas trends in intentions to graduate from a four-year college differ sharply from both. Both for serving in the military and for graduating from a two-year college, the majority of high school seniors from 1976 to 1995 say they Definitely Won't pursue that activity. In addition, the proportion of those

students who state they Definitely Won't participate in both activities has grown since 1990. During the same time period, however, the proportion of students who say they Definitely Will graduate from a two-year college has grown substantially, while the proportion who say they Definitely Will serve in the military grew up to the 1980s and has declined since then. In contrast, the proportion of students who say they Definitely Will graduate from a four-year college grew dramatically and steadily, while the proportion who state they Definitely Won't or Probably Won't fell.

The analysis presented above provides a sense of aggregate changes in an important supply-side factor of the military enlistment process. The combination of declining proportions of students expressing positive intentions toward military service and rising proportions expressing positive intentions toward college provides some preliminary support for the idea that colleges, particularly four-year colleges, may be becoming an increasingly important competitor in the market for high-quality youth. To more fully understand the nature and extent of this competition, we need information about the characteristics associated with intentions to graduate from a two-year college, to graduate from a four-year college, or to join the military. The next section presents a description of the multivariate method of analysis used. In addition, it provides details of the specified model of postsecondary intentions.

MULTIVARIATE METHOD AND MODELS

Method of Analysis

Although the aggregate trends reported in the previous section are useful in providing an overall picture of the changing recruiting market, an understanding of the individual-level characteristics associated with different levels and types of intentions is needed to design effective recruiting strategies and incentives targeted at different groups of youth. A multivariate analysis is required to assess the effects of various individual-level factors on students' postsecondary intentions. The specific multivariate method employed in this chapter is multinomial logistic regression modeling. The choice of this method is justified for both substantive and methodological reasons. Substantively, the multinomial logistic method provides information

about the characteristics that differentiate those who are uncertain about their postsecondary intentions—and thus represent a potentially receptive market for military recruiting—from those whose plans are more definite. Methodologically, multinomial logistic models are the most technically appropriate models based on the way postsecondary intentions are measured in the MtF data. The next subsection provides a more detailed methodological and substantive rationale for the multivariate analysis that follows.

As stated earlier, the MtF surveys ask high school students to indicate their postsecondary intentions to engage in various activities by stating that they either Definitely Will, Probably Will, Probably Won't or Definitely Won't pursue a given activity. Many analyses of military propensity (see, for example, Orvis et al., 1996) collapse categories such as these into high propensity (Definitely Will and Probably Will) and low propensity (Definitely Won't and Probably Won't). Although such treatment of the data makes both the choice of method of analysis (usually logistic regression or probit models) and the interpretation of results rather straightforward, much information is lost by combining several distinct categories into one. In addition, some analyses of the MtF data treat the intention variables as continuous and employ methods of analysis—such as Multiple Classification Analysis—that estimate effects of independent variables on the mean of the dependent variable (see Bachman et al., 2000).

One critical property of continuous variables is that there is an equal and meaningful distance between response categories. In order to treat the intention variables as continuous, we would have to assume, for example, that the difference between the statements Definitely Won't and Probably Won't is substantively equal to the difference between the statements Probably Won't and Probably Will. Since there is no reason to assume such constant distances between response categories, treating the variables as categorical is more technically appropriate.

There are several other reasons why a method of analysis that allows us to retain all the information provided by the original coding of the intention variables is particularly useful for the purposes of this analysis. First, because the intention trends reported in previous sections of this chapter indicate that there have been very different patterns of change over time and across race and gender groups for each of

the response categories, it seems reasonable to expect that there might be important differences in the predictors of individual responses across categories. For instance, it is possible that the characteristics that are predictive of an individual stating that he/she Definitely Will engage in a particular postsecondary activity may differ from the characteristics that are predictive of an individual stating that he/she Probably Will engage in the same activity. Maintaining the ability to test for such differences is one advantage to not collapsing the response categories to create a dichotomous variable.

Second, maintaining the categorical nature of the dependent variable is justified because different levels of intentions have different predictive powers for future behavior. For example, using the longitudinal portion of the MtF data, Bachman et al. (1998) found that while 70 percent of males who stated they Definitely Will join the military actually had done so within 6 years of graduation, only 30 percent of those who said they Probably Will had followed through. Accession rates for females also differed by level of intention. Bachman et al. (1998) also found differences in college enrollment percentages between high school students—both male and female—who said they Definitely Will graduate from a four-year college and those who said they Probably Will. If one goal of gaining a fuller understanding of high school students' postsecondary intentions is to better predict their future behavior, then analyses that include the full range of intentions will yield the most accurate information.

Third, analyzing predictors for the full range of individual intentions may also help policymakers target recruiting resources more efficiently by distinguishing between individuals who are already definite about their plans and those who are uncertain and therefore still open to influence. As noted earlier, the proportion of youth who state they Definitely Will join the military has remained relatively small over time. This small group of youth tends to behave in consistently predictable ways, with a 70 percent enlistment rate for males in this category. This group would seem to be little affected by changes in recruiting strategies or resources, indicating that a more efficient use of resources might be to target the larger group of high school seniors who are undecided about their military intentions—those who say they either Probably Will or Probably Won't join. Recruiting strategies aimed at increasing the proportion of these youth who actually enlist would be more cost-effective because of the potentially larger

payoff in terms of increased enlistments. The multinomial logit approach allows me to assess the impact of individual factors on each level of military intention. In this way, the model can provide information about the characteristics of students who fall into each category.

Similar reasons would support an analysis of college intentions that maintains the categorical nature of those measures as well. It might be particularly important to policymakers to understand the individual characteristics of high school students who are less than certain about their college plans (those who say they either Probably Will or Probably Won't graduate from a two-year or four-year college). These individuals might be particularly receptive to recruiting strategies aimed at attracting potentially college-bound youth into the military through some form of education benefits combined with military service. This might be especially true if their indecision is based primarily on financial considerations.

Fourth, multinomial logit models neither assume nor force an order on the values of the dependent variable. Ordinary linear regression models, and binary models that split intentions into high and low categories only, can tell us only whether the independent variables are associated with increased or decreased intentions. Because many analyses of postsecondary intentions are aimed solely at understanding this dynamic, they employ models that assume the appropriate ordering of intention measures is from low to high.

In a multinomial logit model, the researcher can assess the effects of the independent variables on each of the categories of the dependent variable, regardless of any implied ordering. As reported earlier, one of the important trends in postsecondary intentions over time is that students have become more definite about their intentions to pursue certain activities. Exploring covariates of this dynamic implies a different ordering of the intention variables than the standard lowest-to-highest intent. By not forcing any order on the dependent variable, multinomial logit models allow the researcher to assess both kinds of trends.

Given both the methodological and substantive justifications for treating the three measures of intentions as categorical, the three models of intentions estimated are multinomial logistic regression

models.[5] In a multinomial logit model, the effects of the independent variables are allowed to differ for each outcome of the dependent variable (Long, 1997). In the multinomial logit models of postsecondary intentions, the outcomes of the dependent variables are Definitely Will, Probably Will, Probably Won't, and Definitely Won't. This advantage of a multinomial logit model means that the results will indicate whether a variable raises the likelihood of one outcome relative to the reference category while lowering the likelihood of another outcome relative to the reference category. Since the reference outcome for each of the three models is the lowest level of intention (Definitely Won't), we might expect that the direction of the effect of most variables will be the same for all the other outcomes—indicating that the variable either increases intentions or decreases them. However, as we saw in the data on trends in two-year college intentions, for example, the main trend is toward increasing certainty of intentions. In this case, we would expect that time (measured by year of the survey) will have a positive effect on the probability of youth stating they Definitely Will graduate from a two-year college and a negative effect on the probability of stating they either Probably Will or Probably Won't. None of the other commonly used regression models (e.g., ordinary least squares estimates of linear regression models, binary logistic regression or probit models, or ordered logistic or probit models) would capture this dynamic. The following three multinomial logit models are estimated in this analysis:

- A model of the predictors of two-year college intentions
- A model of the predictors of four-year college intentions
- A model of the predictors of military enlistment intentions.

For each model, a set of independent variables expected to be related to various postsecondary activities is included. For each independent variable, the multinomial logit model provides estimates of the amount by which the predicted odds of a given outcome (compared

[5]Although the variables could also be considered ordinal, indicating that ordered logit models would be appropriate, ordered logit models assume that the effect of a change in an independent variable is the same for all values of the dependent variable. Results of a Lagrange multiplier test indicate that these data violate this *proportion odds assumption*, rendering ordered logit models inappropriate.

with a designated reference outcome) are multiplied for each one-unit change in the value of the independent variable, all other things being equal (Hamilton, 1992). For each of the three models, the reference category is Definitely Won't. The next subsection describes each of the independent variables included in the models and presents a brief explanation of how they relate to the underlying model of intentions (the random utility model) and to previous research.

Specification of Models

According to the random utility model, individuals will base their choices of activities on the relative utility of each activity, choosing the activity that has the maximum expected utility. In this chapter, individuals' propensities to engage in various activities are likewise assumed to be based on their perception of the relative utility of the activity. Applying this framework to the postsecondary intentions of high school seniors, we expect that students' intentions to engage in each of the three activities analyzed (graduate from a two-year college, graduate from a four-year college, and enlist in the military) will be based on the relative costs and benefits of that activity for the individual. With that in mind, the estimated models include variables related to time and demographic factors as well as variables related to the expected returns to education and/or military service.

Time and Demographic Factors. Consistent with the overall focus of this research, year of the survey is included to allow for an estimation of how the odds of having various intention levels for each of the three activities have changed from year to year, all other things being equal. Since the analysis of temporal trends in postsecondary intentions presented earlier clearly indicates that the effect of time on intentions is not linear, time is measured by a series of dummy variables represented each year of the survey (the reference category is the first year of the survey, 1976).

As noted in the analysis of trends in postsecondary intentions reported above, the determinants of particular postsecondary intentions are likely to vary by both race and gender. Prior research also indicates that postsecondary intentions vary by race-gender groups (Bachman et al., 1998). Dummy variables for white females, black females, and black males (with white males as the reference

category) are included in each model. Table 2.1 provides sample means of each independent variable by race and gender.

Since the availability of various types of educational opportunities varies by region, the models also include dummy variables indicating whether the student resides in the South, Northeast, or West; with the Midwest serving as the reference category. These variables are in effect coded,[6] so that the coefficient for each variable is an estimate

Table 2.1

Means of Independent Variables by Race and Gender

Variable	White Males	Black Males	White Females	Black Females
Living with both parents	.82	.52	.81	.52
Has siblings	.74	.67	.74	.71
Mother works	.69	.88	.70	.89
Lives in South	.27	.56	.27	.56
Lives in West	.17	.09	.16	.08
Lives in Northeast	.23	.17	.23	.17
H.S. GPA C+	.13	.22	.09	.17
H.S. GPA B–	.16	.19	.13	.17
H.S. GPA B	.21	.18	.22	.21
H.S. GPA B+	.16	.12	.21	.18
H.S. GPA A–	.10	.05	.15	.09
H.S. GPA A	.09	.03	.13	.05
Took college prep. course	.55	.44	.58	.48
Took vocational/technical course	.13	.15	.10	.15
Used marijuana	.54	.47	.48	.37
Used marijuana missing	.02	.05	.01	.04
Engaged	.03	.03	.08	.08
Married	.02	.04	.02	.03
Lives in city	.24	.51	.27	.54
Lives in suburbs	.27	.14	.26	.13
Father's education	14.09	12.70	13.90	12.48
Mother's education	13.58	13.15	13.48	12.95
Hours worked per week	14.87	11.56	13.51	10.56
Weekly wages	3.08	2.62	2.85	2.36

SOURCE: Monitoring the Future (1976–1995).

[6]The purpose of effect coding (or deviation coding) is to express the deviation of each category's effect from the central tendency of all the other categories. In effect coding, a series of dummy variables equal to the number of categories of X–1 are created. The omitted category is coded –1 for all other categories of X. So each variable is coded 1 for its own category, –1 for the omitted category, and 0 for all other categories.

of the effect of living in that region as opposed to living in any of the other regions. Since a disproportionate number of military posts are located in the South, we would expect that living in the South might have a positive effect on military intentions. Likewise, since a disproportionate number of two-year colleges are located in the West (U.S. Department of Education, 1998), we would expect that living in the West would have a positive effect on two-year college intentions. Since both the availability and the costs of two- and four-year colleges differ by region (National Council of Educational Statistics, 1998), where an individual lives will affect both the expected costs and the expected returns of postsecondary education. In addition, local labor market conditions, such as unemployment rates, affect individual enlistment propensity (see, for example, Kilburn and Klerman, 1999). According to the random utility framework, these factors indicate that the relative attractiveness of various postsecondary activities will be affected by geographic location.

The final demographic factor included in the model is a measure of whether the respondent lives in a city, suburb, or rural environment. The amount and quality of the resources available to high school students to assist them in making career choices is likely to vary by type of community. We would expect that students in suburban communities will have higher college expectations because of the better resources generally available in suburban schools and communities. Therefore, students in suburban areas may be more likely to have access to information on the relative benefits of a college education and may have greater access to information and assistance in financing a college education. For these reasons, suburban students' perceptions of the utility of a college education might be higher than those of other students. Their intentions to graduate from a two- or four-year college might be higher while their military intentions might be lower.

Expected Returns to Education and/or Military Service. A number of factors might affect an individual's expected returns to college graduation and/or military service. A random utility model of postsecondary intentions implies that the higher an individual's expected returns for a particular activity, the more positive will be that individual's intention to pursue that activity.

The cost of obtaining information about college applications and college choices is likely to be lower for students whose parents attended college. In addition, parents with more education may be likely to pass on their taste for education to their children. Previous research on postsecondary decisions indicates that mother's education has a negative effect on the probability of enlisting and a generally positive effect on the probability of attending college (Kilburn and Klerman, 1999). For these reasons, father's and mother's education are both included in the models, with the expectation that higher levels of parental education will predict higher levels of college intentions and lower levels of military intentions.

The type of high school program a student is enrolled in is likely to be both an early indicator of intentions and a source of relevant resources, skills, and information. High school program type is included in the model, with the expectation that enrollment in a college preparatory program will be predictive of higher college intentions. Participation in a college preparatory program in high school may be an indicator of an expectation for more education. This expectation not only predicts higher college intentions but also has been shown to be negatively related to military intentions (Segal et al., 1999). Participation in a vocational/technical program not only provides less information and preparation for college attendance, but is also likely to be an early indication of an intention to pursue something other than college after graduation. Because many military jobs require technical skills and interests, we expect that enrollment in a vocational/technical program will be associated with higher military intentions. Enrollment in a particular kind of high school program can be seen as both an indicator of the individual's perception of the expected utility of various activities and as a possible influence on the size of the costs and benefits expected from choosing alternative activities.

A number of measures of human and social capital are included in the model, based on their expected effects on perceptions of the relative costs and/or returns to various postsecondary activities. Students who live with both parents are likely to have greater resources to afford college, making them more likely to have positive college intentions and negative military intentions. Having a mother who works is likely to increase family income and make the costs of college more affordable, so having a mother who works is expected to

increase students' college intentions. Students with siblings will have fewer resources available to meet college costs; they therefore are likely to have lower levels of college intentions and potentially higher military intentions. All of these family level variables represent various measures of the social capital available to students. Based on the general random utility framework, we would expect that students with higher social capital will be better able to forgo full-time employment after high school (either in the labor market or in the military) in favor of the greater long-term expected returns/utility of obtaining a college degree. Kilburn and Klerman (1999) found that mother's education, family income, and number of siblings all affected enlistment behavior, primarily through their relationship to college choices. The same dynamic is likely to be at work in the effects of these factors on enlistment and college intentions.

The costs of college might be substantial for students who are married or engaged, making the immediate income of military service more attractive. The opportunity costs of attending college and forgoing needed income may be especially high for individuals with family responsibilities. Therefore, being married or engaged is expected to increase military intentions while lowering intentions to graduate from college. This expectation is consistent with findings presented in Kilburn and Klerman (1999).

Students with higher grades in high school can expect to have a greater availability of college choices. We might also expect that students with higher grades would expect greater returns to college based on their demonstrated academic abilities. Higher grades in high school should also predict higher college intentions and lower military intentions. Previous research has shown that measures of cognitive ability (primarily as measured by the AFQT) are not linearly related to enlistment. In fact, individuals with very low abilities and individuals with very high abilities are both unlikely to enlist (Hosek and Peterson, 1985 and 1990; and Kilburn and Klerman, 1999). The choice to attend a two- or four-year college is not likely to bear a linear relationship to ability. Students with particularly low ability (grades) might realistically see little opportunity and/or utility to attending college at all, while students in the middle range may aim for a two-year college degree if they believe standards of admission and performance to be less stringent at a two-year versus a four-year college. At the highest end of ability, we would expect grades to have

a positive influence on intentions to attend a four-year college, with a corresponding negative effect on military and two-year college intentions. To capture the dynamics of these relationships, dummy variables for each grade point average (GPA) category are included.

Another factor that might influence an individual's college and military intentions is civilian labor market opportunities. The general relationship between measures of civilian labor market opportunities and enlistment has been demonstrated in much prior research (see, for example, Hosek and Peterson, 1985 and 1990; and Orvis et al., 1996). In addition, Kilburn and Klerman (1999) demonstrate that both the choice to attend college and the choice to enlist are affected by factors associated with the choice to work in the civilian labor market. Higher wages and greater number of hours worked during high school suggest that the value of working in the civilian labor market will be greater. Because of this, higher levels of both of these factors are expected to predict lower levels of intentions to graduate from college and to join the military. The student wage variable is based on students' reported average weekly income, and the variable measuring hours worked is based on the average time spent per week in paid employment.

Because of the moral standards imposed by the military on potential recruits, a variable indicating whether students report having used marijuana is included in the model. Because using marijuana might indicate that an individual is either unlikely to meet military entrance standards or unlikely to want to join an organization with strict moral standards, it is expected that having used marijuana will be associated with lower levels of military intentions. Based on Kilburn and Klerman's (1999) findings that using marijuana increases the probability that a youth will choose work or other activities over both college and the military, it is likely that having used marijuana will have a negative effect on college intentions. A variable indicating that a value is missing for the self-reported marijuana use question is included to test whether those students who do not answer are also less likely to intend to join the military.

Intentions to Engage in Other Activities. Finally, to better understand the relationship among military intentions, two-year college intentions and four-year college intentions, measures of each type of intention are included in the models of the other intentions.

In other words, measures of two-year college intentions and four-year college intentions are included in the model of military intentions. Military intentions and two-year college intentions are included in the model of four-year college intentions, and military and four-year intentions are included in the model of two-year college intentions. If high school students see college and the military as mutually exclusive or competing choices, then higher military intentions will predict lower levels of intentions for both two-year and four-year college graduation. Similarly, intentions to attend a two-year college will be negatively related to military intentions and four-year college intentions. Intentions to graduate from a four-year college will be negatively related to both two-year intentions and military intentions. Alternatively, we might find this to be mainly true for students with firm intentions—those who say they Definitely Will engage in one of the activities. Individuals who indicate uncertainty (stating they either Probably Will or Probably Won't pursue that activity) about any one particular activity may actually be more likely to be uncertain about all of the options before them. If this is the case, stating one Probably Will or Probably Won't engage in any one of the three activities of interest will be positively related to stating one Probably Will or Probably Won't engage in the other activities. Maintaining the full categorical range of the intention variables and estimating multinomial logit models allows me to test these ideas and will provide some evidence of the extent to which high school seniors view two- and four-year colleges and the military as competing alternatives.

The next section of the chapter presents the results of the multinomial logit regressions. Results for two-year college intentions are presented first, followed by four-year college intention results and military intention results.

MULTINOMIAL LOGIT RESULTS

For each of the models, the results indicate the effects of each independent variable on each level of intention to engage in the specified activity (graduate from a two-year college, graduate from a four-year college, or join the military). Full results of all three multinomial models of intentions are shown in Tables A.1, A.2, and A.3 in Appendix A. In these tables, the Relative Risk Ratio (RRR) reported for

each independent variable for each level of intention indicates the amount by which the odds of an individual stating that level of intention compared with stating they Definitely Won't engage in that activity are multiplied for each unit change in the independent variable. For example, the odds of stating one Probably Won't graduate from a two-year college over stating one Definitely Won't are multiplied by a factor of .97 (decreased by 3 percent) for each additional year of mother's education (see Table A.1). Because of the extremely large sample size (N = 206,411), the majority of the coefficients are statistically significant, even when the effects are not substantively very large. For this reason, as well as for ease of presentation and accessibility, the discussion of results is restricted to findings of particular interest and relevance to the research questions. For each model, the effects of race and gender and the effects of other postsecondary intentions are discussed. Other factors shown to have particularly large impacts on each type of intention are also discussed. In addition, the tables included in this discussion section indicate only the direction of the effect of each variable and its significance level.

Two-Year College Intentions

Table 2.2 displays the direction and significance level of the effects of selected variables on two-year college intentions. For each variable discussed, + indicates that the variable has a positive effect on the given level of intentions and – indicates a negative effect. All results should be understood in reference to the Definitely Won't category. So, for example, Table 2.2 shows that holding everything else constant, being from the West has a positive and statistically significant effect ($p < .01$) on all levels of two-year college intentions relative to stating that one Definitely Won't graduate from a two-year college. This can be seen by the + sign with three asterisks in each intention column for the West variable. (The number of asterisks indicates the level of statistical significance.) For information about the magnitude of the effects, see the Relative Risk Ratios reported in Appendix A, Table A.1.

Effects of Race and Gender. Looking first at race and gender effects, we see that the odds for all levels of two-year college intentions

Table 2.2

Multinomial Logit Estimates of Effects of Selected Variables on Two-Year College Intentions

Variable	Probably Won't	Probably Will	Definitely Will
Black female	+	+***	+***
White female	+***	+***	+***
Black male	+***	+***	+***
Lives in South	+***	–***	–***
Lives in West	+***	+***	+***
Lives in Northeast	–***	–***	–***
H.S. GPA C+	+***	+***	+***
H.S. GPA B–	+***	+**	+***
H.S. GPA B	+	–***	+
H.S. GPA B+	–***	–***	–***
H.S. GPA A–	–***	–***	–***
H.S. GPA A	–***	–***	–***
Took college prep course	–***	–***	–***
Probably Won't join military	+***	+***	+***
Probably Will join military	+***	+***	–***
Definitely Will join military	+***	–***	–***
Probably Won't graduate from four-year college	+***	+***	+***
Probably Will graduate from four-year college	+***	+***	+***
Definitely Will graduate from four-year college	+***	–***	–

SOURCE: Monitoring the Future (1976–1995).

NOTE: Reference category of the dependent variable is Definitely Won't. * = $p < .10$, ** = $p < .05$, *** = $p < .01$.

relative to Definitely Won't are greater for almost all females. Compared with white males, black females are over 100 percent more likely to state they Probably Will graduate from a two-year college, and 70 percent more likely to state they Definitely Will. White females are 45 percent more likely than white males to state they Probably Will and 65 percent more likely to state they Definitely Will.

Among males, the major race effect seems to indicate that blacks are less definite about their plans to graduate from a two-year college than whites. Black males are 11 percent more likely than white males to state they Probably Won't graduate from a two-year college and 70 percent more likely to state they Probably Will. Black males are also 11 percent more likely than white males to state they Definitely Will

graduate from a two-year college, but this effect is only marginally significant ($p < .05$). This may indicate that the previously reported racial differences in two-year college propensity may be at least partially attributable to differences in other factors, such as grades or parental education, which are controlled for in the multivariate analysis.

Effects of Other Postsecondary Intentions. Looking at the effects of other postsecondary intentions on intentions to graduate from a two-year college, our first finding of note is that indefinite four-year college intentions have significant positive effects on all levels of two-year intentions (relative to Definitely Won't). This can be seen by the positive and significant effects of stating one Probably Won't graduate from a four-year college and the positive and significant effects of stating one Probably Will graduate from a four-year college. The effects of stating one Probably Won't graduate from a four-year college on all levels of two-year college intentions are particularly large (see Table A.1). It appears that one reason students may be stating that they Probably Won't graduate from a four-year college is that they intend to graduate from a two-year college instead.

In comparison, stating one Definitely Will graduate from a four-year college decreases the odds of stating one Probably Will graduate from a two-year college by over 40 percent and has a positive but not significant effect on the odds of stating one Definitely Will do so. Those with definite intentions to graduate from a four-year college are apparently not inclined to graduate from a two-year college.

For military intentions, stating that one Probably Won't join the military increases the odds of all levels of two-year college intentions relative to Definitely Won't. Those who state they Probably Will serve in the military are also more likely to state they Probably Won't and are more likely to state that they Probably Will graduate from a two-year college. However, stating one Probably Will serve in the military significantly decreases the odds of stating one Definitely Will graduate from a two-year college by 14 percent. In contrast, stating one Probably Will graduate from a four-year college increases the probability of stating one Definitely Will graduate from a two-year college by over 400 percent.

Stating one Definitely Will serve in the military also decreases the odds of stating one either Probably or Definitely Will graduate from a two-year college by 30 percent and 35 percent respectively. This is consistent with the idea that individuals who state they Definitely Will join the military are highly likely to do so (see Bachman et al., 1998), making them unlikely to state they will pursue other activities. In sum, these findings suggest that those individuals with positive military intentions see pursuing a two-year degree as more incompatible with their intentions than do those with positive four-year college intentions. In other words, the competition between the military and two-year colleges may be more pronounced than the competition between two- and four-year colleges.

Effects of Other Factors. With the exception of military and four-year college intentions variables, residing in the West is the factor with the largest effect on intentions to graduate from a two-year college. The odds that students in the western part of the country will state they Probably Will or Definitely Will graduate from a two-year college are more than 100 percent greater than those for other students. This finding may be due to the prevalence of two-year colleges in the West, making this option more readily available to students living there (U.S. Department of Education, 1998). Having high grades (B+ averages and above), and being in a college preparatory program both have large, significant negative effects on the propensity to graduate from a two-year college. As we will see in the next subsection, this is likely due to the positive effects of these variables on intentions to graduate from a four-year college.

Effects of Time. Regarding the effects of time on two-year college intentions, Table B.1 in Appendix B displays the year coefficients for two-year college intentions. In general, the results show that from 1981 on, the odds of students stating that they either Probably Will or Definitely Will graduate from a two-year college increased relative to 1976. The coefficients are generally larger for the Definitely Will category, indicating that time has larger effects on the probability of having definite rather than probably positive intentions. For most years, there is no significant difference in the odds of stating one Probably Won't graduate from a two-year college. These findings are all consistent with findings reported in earlier parts of the chapter concerning the modest increase in positive propensity combined with increased certainty regarding two-year colleges.

Four-Year College Intentions

Selected results from the model of four-year college intentions are shown in Table 2.3. (Full results, including the magnitude of all effects, are displayed in Table A.2 in Appendix A.) As in the model for two-year college intentions, the reference category for the model is Definitely Won't, and all findings should be interpreted accordingly. The effects of a variable on the odds of stating any particular level of four-year college intentions is always in reference to the odds of stating one Definitely Won't graduate from a four-year college. As before, + indicates the variable listed in the left-hand column has a positive effect on the intention level indicated, and – indicates a negative effect. Asterisks are again included to indicate significance level.

Effects of Race and Gender. One of the first findings of note is that when controlling for factors such as parental education and high school grades, being a white female has a generally negative effect on intentions to graduate from a four-year college, while being a black female or a black male has a generally positive effect. All other things being equal, being a white female decreases students' odds of stating they either Probably Will or Definitely Will graduate from a four-year college by factors of approximately 30 percent in each case. In contrast, being a black female increases the odds that students will say they Probably Will graduate from a four-year college by almost 40 percent and increases the odds of stating they Definitely Will by 164 percent. This is consistent with the finding reported earlier that four-year college intentions have been consistently highest among black females.

Effects of Other Postsecondary Intentions. Turning to the intentions variables, we see that all levels of military and two-year college intentions are associated with increased odds of stating one Probably Won't graduate from a four-year college. The effects of two-year college intentions are strikingly large, implying that students who are positively inclined to graduate from a two-year college are extremely likely to also have at least probable positive intentions to graduate from a four-year college, while they are less likely to have definite intentions to do so. The advantages of the multinomial logit model are evident in the contrast of the negative effect of stating one Probably Will or Definitely Will graduate from a two-year college on stating one Definitely Will graduate from a four-year college with the

large positive effects of two-year intentions on less firm levels of four-year intentions. It appears that for students who are uncertain about their college intentions, the possibility of attending a two-year college is not seen as a competing option with attending a four-year college.

The effects of military intentions on four-year college intentions are even more complex. Those who state that they Probably Won't serve in the military are more likely to have some positive inclination to graduate from a four-year college intentions than to state that they Definitely Won't graduate from a four-year college. In contrast, students with positive military intentions (i.e., those who state they ei-

Table 2.3

Multinomial Logit Estimates of Effects of Selected Variables on Four-Year College Intentions

Variable	Probably Won't	Probably Will	Definitely Will
Black female	–	+***	+***
White female	–***	–***	–***
Black male	+***	+***	+***
H.S. GPA C+	+***	+***	+***
H.S. GPA B–	+***	+**	+***
H.S. GPA B	+***	+***	+***
H.S. GPA B+	+***	+***	+***
H.S. GPA A–	+***	+***	+***
H.S. GPA A	+***	+***	+***
Took college prep course	+***	+***	+***
Engaged	–***	–***	–***
Married	–***	–***	–***
Probably Won't join military	+***	+***	+***
Probably Will join military	+***	–**	–***
Definitely Will join military	+***	–***	–***
Probably Won't graduate from two-year college	+***	+***	+***
Probably Will graduate from two-year college	+***	+***	–***
Definitely Will graduate from two-year college	+***	+***	–***

SOURCE: Monitoring the Future (1976–1995).

NOTE: Reference category of the dependent variable is Definitely Won't. * = $p < .10$, ** = $p < .05$, *** = $p < .01$.

ther Probably or Definitely Will join the military) are significantly less likely to have positive intentions to graduate from a four-year college. This can be seen by the negative and significant effects of both stating one Probably Will and of stating one Definitely Will join the military on the likelihood of stating one Probably Will or Definitely Will graduate from a four-year college. The negative effects of stating one Definitely Will join the military are especially large (see Table A.2), which is consistent with the idea that individuals who say they Definitely Will serve are very likely to do so, making it unlikely that they intend to pursue other activities. Again, the multinomial logit model allows us to see the complexities of the relationships between military intentions and college intentions that would not be detected by linear models and/or models based on binary intention variables.

Effects of Other Factors. Not surprisingly, other than two-year college and military intentions, the variables with some of the largest effects on the odds of increasing levels of four-year college intentions are being in a college preparatory program and high school grades. For example, being in a college preparatory program increases the odds of stating one Probably Will versus Definitely Won't graduate from a four-year college by nearly 400 percent, and increases the odds of stating one Definitely Will by over 700 percent. Students with average high school grades of A, have odds of stating they Definitely Will graduate from a four-year college versus stating they Definitely Won't that are over 10 times higher than the odds of students with average grades below the C+ range (the reference category for grades). In addition, as expected, being engaged or ever married has relative large negative effects on the odds of all levels of four-year college intentions relative to Definitely Won't.

Effects of Time. The year coefficients for four-year college intentions are displayed in Table B.2 in Appendix B. Like the effects of time on two-year college intentions, these results are consistent with the trends reported earlier. From the early 1980s on, students were more likely each year to state they Probably Will or Definitely Will graduate from a four-year college. As with the two-year results, the effects of time are particularly strong for the likelihood of being definitely positive about graduating from a four-year college. From the mid-1980s on, the odds that a student will state they Probably Won't (rather than Definitely Won't) graduate from a four-year college also increased.

Military Enlistment Intentions

Effects of Race and Gender. Table 2.4 displays the direction and significance level of selected variables on military intentions. (Full results including the magnitude of all effects, are reported in Appendix A, Table A.3.) Looking at the results of the model of military intentions, we see that the findings regarding the effects of the race-gender dummy variables are consistent with prior research. Specifically, being a black male increases the odds of stating one Probably Will join the military and of stating one Definitely Will join the military by over 100 percent in both cases. Both black and white females have lower odds of stating any kind of military intention

Table 2.4

Multinomial Logit Estimates of Effects of Selected Variables on Military Intentions

Variable	Probably Won't	Probably Will	Definitely Will
Black female	−***	−***	−***
White female	−***	−***	−***
Black male	−***	+***	+***
H.S. GPA C+	−***	−***	−
H.S. GPA B−	−***	−**	−
H.S. GPA B	−***	−***	−
H.S. GPA B+	−***	−***	−***
H.S. GPA A−	−	−***	−**
H.S. GPA A	+	−***	−**
Took college prep course	+***	−***	−***
Probably Won't graduate from four-year college	+***	+***	+***
Probably Will graduate from four-year college	+***	−**	−***
Definitely Will graduate from four-year college	+***	−***	−***
Probably Won't graduate from two-year college	+***	+***	+***
Probably Will graduate from two-year college	+***	+***	−***
Definitely Will graduate from two-year college	+***	−*	−

SOURCE: Monitoring the Future (1976–1995).

NOTE: Reference category of the dependent variable is Definitely Won't. * = p < .10, ** = p < .05, *** = p < .01.

other than Definitely Won't, with being a white female having a larger negative effect than being a black female. This is consistent with findings that black males have over time had the highest overall levels of military propensity, whereas females—especially white females—have significantly lower military propensities than males.

Effects of Other Postsecondary Intentions. The effects of college intentions on military intentions are different for two- and four-year colleges. Students who state they Probably Won't graduate from a four-year college and those who state they Probably Won't graduate from a two-year college are generally more likely to indicate all levels of military intentions relative to Definitely Won't. Students with positive four-year college intentions (stating they either Probably Will or Definitely Will graduate) are more likely to state they Probably Won't serve in the military and less likely to state that they either Probably Will or Definitely Will do so. Specifically, those who say they Probably Will graduate from a four-year college are 10 percent less likely to say they Probably Will serve in the military and 30 percent less likely to say they Definitely Will. Those who claim they Definitely Will graduate from a four-year college are nearly 40 percent less likely to state that they Probably Will serve in the military and over 50 percent less likely to state that they Definitely Will. These findings suggest that students may view graduating from a four-year college as incompatible with intending to serve in the military.

While those who say they either Probably Will or Definitely Will graduate from a two-year college are less likely to state they Definitely Will join the military, they are not less likely to say they Probably Will serve. Stating one Definitely Will graduate from a two-year college has only a small and marginally significant ($p < .10$) effect on the odds of stating one Probably Will join the military. Stating one Probably Will graduate from a two-year college does, however, significantly *increase* the odds of stating one Probably Will serve in the military by 60 percent. From this perspective, positive intentions to graduate from a two-year college do not appear to be viewed as entirely incompatible with military service. Students with positive intentions to graduate from a two-year college appear to be at least open to the idea of enlisting. In contrast, positive intentions to graduate from a four-year college have consistently negative effects on the odds of having positive military intentions, indicating that ob-

taining a four-year college degree is viewed as less compatible with military service.

Effects of Other Factors. Like their effects on two-year college intentions, high school grades and being in a college preparatory program have negative effects on military intentions. Since these variables measure academic abilities, this finding indicates that the armed forces are likely to experience difficulty recruiting among high-quality youth, as measured by academic ability. The more academically oriented and successful students are in high school, the more likely they are to intend to pursue a four-year college degree and the less likely they are to intend to either pursue a two-year degree or join the military.

Effects of Time. Table B.3 in Appendix B contains the coefficients for the effect of year of survey on military intentions. These figures show that there has been a fairly steady decrease each year (relative to 1976) in the odds that students will say they either Probably Won't or Probably Will join the military. The results also show that between 1983 and 1989, the odds that students would state that they Definitely Will join the military were significantly greater than they were in 1976. From 1990 on, however, the odds that a student would indicate such definite plans for military service returned to their 1976 level. As with the coefficients for college intentions, the results for military intentions are generally consistent with the results reported earlier regarding the trends in postsecondary intentions of high school students.

SUMMARY AND RECOMMENDATIONS

In examining changes in the postsecondary intentions of high school seniors, this chapter has presented trends in the proportion of students who report various levels of intentions to graduate from a two-year college, graduate from a four-year college, and serve in the military. Multinomial logit models of intentions to engage in each activity were also estimated, and the effects of a number of predictors of individual intentions were assessed and presented. By describing overall changes in the educational and enlistment intentions of high school students, as well as estimating the effects of various individual characteristics on postsecondary intentions, these

results should provide policymakers with information regarding important changes in the supply side of the enlistment process.

In terms of changes in postsecondary educational intentions over the past twenty years, the most notable trend is the dramatic increase in intentions to graduate from a four-year college. Across all race and gender groups, the proportion of high school students who definitely intend to graduate from a four-year college has risen sharply since 1976, whereas the proportion who reject the idea of pursuing a four-year college degree has dropped considerably.

In contrast, the main trend in intentions to graduate from a two-year college has been in the direction of students becoming more definite about their two-year college plans. The proportions of students in both the Definitely Will and the Definitely Won't categories have grown. As the returns to a college education have grown, more students are expressing firm intentions to graduate from both two- and four-year colleges.

The picture regarding trends in military intentions contrasts sharply with the college intention trends. Consistent with much previous research in this area, my results indicate an overall downward trend in military intentions over the past twenty years, with a particularly sharp decline in positive propensity for black males. In addition, although the proportion of students with negative propensity toward the military (either Probably Won't or Definitely Won't) has risen only slightly overall, the group is increasingly made up of individuals with the lowest propensity and the lowest enlistment rates: those who say they Definitely Won't join.

The multivariate analysis, presented and discussed the individual factors that affect high school students' postsecondary intentions. The results of the multinomial logit analyses indicate that certain factors affect two-year college intentions differently from the way they affect four-year college intentions. For example, being in a college preparatory program and having higher grades in high school generally decrease the odds of having positive intentions to graduate from a two-year college but increase the odds of having positive intentions to graduate from a four-year college. Both of these factors also exert a negative effect on the odds of having positive military intentions, a finding that may not bode well for future recruiting efforts

aimed at attracting high-quality youth. The more academically oriented and successful students are, the more likely they are to eschew both two-year college and the military in favor of pursuing a four-year degree.

These results do indicate, however, that students in general do not seem to see two- and four-year colleges as completely incompatible. This is particularly true for students with positive inclinations about graduating from a two-year college because they are more likely to also have some positive intentions of attaining a four-year degree as well. Students who are definite about graduating from a four-year college, however, are unlikely to have positive propensity for either two-year college or the military. The dramatic growth of this group over the past 20 years most likely accounts for a substantial portion of the declining propensity of youth to join the military.

The estimates of the effect of military intentions on odds of having varying levels of college intentions generally support the idea that individuals who state they Definitely Will join the military are unlikely to have positive intentions toward either two-year or four-year college. In other words, the students who are definite about their plans to join the military are not likely to be planning to pursue either a two- or a four-year degree. This finding, combined with the fact that these youths are highly likely to actually enlist, may indicate that educational incentives aimed at this group may not be a very efficient use of resources.

On the other hand, students who state they Probably Will serve in the military are more likely to also say they Probably Will graduate from a two-year college. Those who Probably Won't join the military are likely to have positive intentions to graduate from a two- or four-year college. The proportion of students who state these uncertain intentions regarding military service is over four times larger than the proportion who state that they Definitely Will serve. Offering educational incentives designed to attract this larger group of students might be a more efficient recruiting strategy. Since two-year colleges may represent slightly less competition, given the finding that students who Probably Will attend two-year colleges are also more likely to say they Probably Will join the military, recruiting strategies designed to allow students to combine two-year college attendance with military service might be particularly effective. Other educa-

tional incentives might be effective in convincing those students with positive educational incentives that military service need not be incompatible with such goals.

In addition to revised recruiting strategies, further research should be directed at gaining a more complete understanding of the dynamics of high school students' postsecondary intentions and the effects of those intentions on the recruiting market. If the proportion of young people with definite intentions to serve in the military continues to decline, continued analyses of the characteristics and other intentions of those with less definite military intentions is warranted.

Even those students who are not definite about their future plans as they near graduation must eventually make some choice. In fact, at least 50 percent of eventual enlistees traditionally come from groups of individuals whose intentions to serve in the military were not definite as late as two months prior to high school graduation. Understanding the factors that influence the eventual choices made by youth with relatively uncertain intentions might provide the armed services with valuable information that could be used to design recruiting strategies and incentives aimed at influencing the resolution of that indecision in the direction of military service.

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Chapter Three

PAYING FOR COLLEGE: A SURVEY OF MILITARY AND CIVILIAN FINANCIAL AID PROGRAMS AND POSTSECONDARY EDUCATION COSTS

C. Christine Fair

INTRODUCTION

College Attendance and the Challenge to Recruiting

Recent difficulties by the services in meeting recruitment targets are in part a result of the business cycle. The civilian labor market experienced a long period of robust growth in the 1990s; the unemployment rate, which was 7.3 percent in January 1992, declined to 4.7 percent in January 1998 (Bureau of Labor Statistics, 1998). However, there is reasonable evidence to suggest that difficulties in meeting recruitment targets are not transitory and will not be mitigated by a contraction of the labor market. Rather, Asch et al. (1999) have suggested that these difficulties may stem in part from permanent changes within the civilian labor market that have made civilian opportunities more attractive to high-quality youth.

Specifically, the labor-market return to attending college has risen dramatically. The college premium—the percentage difference between the real wages of a four-year college graduate and a high school graduate—increased from 40 percent in 1979 to 65 percent in 1995 (Mishel et al., 1997, cited by Asch et al., 1999). Although the 4.3 percent *increase* in the real wage of the college graduate may account for some of this premium, most of it can be attributed to the 11.8 percent *decrease* in the average real wage of high school graduates

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(Asch et al., 1999). Thus, while attending college has an obvious benefit, not attending college also imposes a substantial cost. This expanding college premium appears to be driving the dramatic increases in postsecondary education enrollment rates since the 1980s. As growing numbers of high-quality youth pursue postsecondary education, it would seem that this important target group for military enlistments is contracting.

Two considerations that may affect postsecondary education decisions among high-quality youths are rising costs of college attendance faced by students and changes in the overall financial aid environment. Since the 1980s, the steady growth of postsecondary education enrollments has been accompanied by steep increases in student costs. According to the College Board (1998), between academic year (AY) 1987–1988 and AY 1997–1998, there was a 42 percent increase in tuition among four-year private schools and a 51 percent increase among four-year public schools in real terms.

The past decade has brought changes in the civilian financial aid environment as well. According to some observers, these changes seem to put civilian sources of financial aid into competition with military programs (United States Military Academy, 1997). It has also been noted that attractive aid options are available from other components of the military as well: The various National Guard programs and Selected Reserve programs offer lucrative education package to participants.

How we see this issue of competition depends on whether we look from the perspective of the high school student or from that of the veteran (or active-duty servicemember with education benefits). From the perspective of the high-quality high school youth, civilian and various military financial aid programs may seem to be competing opportunities. For example, the youth may consider taking out loans versus military service or weigh grant aid received versus benefits available through military service. Indeed, the youth may even trade off the costs and benefits of active duty against Selected Reserve participation. However, from the perspective of a veteran or enlistee with military benefits in hand, the programs no longer compete with each other. Rather, they interact. In this chapter, we are interested in both perspectives—competition and interaction.

To attract college-bound youth to enlist into an active component, the various services have offered numerous education programs, among them the Montgomery GI Bill (MGIB), various college funds (CF), tuition assistance (TA) programs, and loan repayment programs (LRP). To ensure that these programs have sufficient appeal to potential recruits, it is important to assess the degree to which benefits have kept up with rising costs of postsecondary education. Likewise, to situate the relevance of active-component benefits, it is also important to survey the civilian financial aid landscape as well as opportunities in other military components.

Objectives of This Chapter

This chapter seeks to address two research objectives that emerge from the concerns outlined above. First, it surveys the assistance programs available through the various components of the military and through federal financial aid programs. Part of the purpose of the survey is to identify, where possible, the interactions between and connections among the various military benefits and the prevailing civilian financial aid programs. This study focuses on programs designed for enlistees, paying particular attention to the MGIB and the CF. Second, the chapter examines the extent to which MGIB and CF dollar amounts have kept pace with expanding costs of postsecondary education attendance. In addition to achieving these objectives, we hope to provide a better sense of the complexity of comparing MGIB and CF benefits to other educational benefits and educational costs.

The chapter is organized as follows. The second section outlines the various educational benefit programs offered through enlistment in the active services as well as the Selected Reserve and the National Guard and summarizes the characteristics of current federal aid programs. It also briefly examines sources of variation in federal aid. The third section explores key trends in college costs faced by students since 1990, paying attention to variation across time, across states, and across types of institution. The fourth section draws several comparisons among the data, employing two methods to assess the purchasing power of both the MGIB and CF monies in relation to costs of attendance and to compare the purchasing power of these programs across time. Although these methods are similar, we use

them to ask different questions of our data. The fourth section also draws several broad comparisons among the various financial aid programs and shows that more-precise comparisons across programs are hampered by both the structure of the programs and the available data about them. Finally, the fifth section concludes with a discussion of concerns emerging from this study that require future investigation. Because this chapter was researched and written during FY 1998, all programs are current as of FY 1998.

FINANCIAL AID PROGRAMS

Overview of Programs

Youth seeking to finance their postsecondary education usually have a variety of options. The active-duty, Reserve, and Guard components of the armed services offer numerous education benefits, and the federal government supports several financial aid programs. College-bound youth may also have access to state, institutional, and foundation aid, depending upon the eligibility requirements of the programs and the institutions they attend. Civilian aid programs, several of which may be bundled into an aid package, offer benefit levels that vary considerably from case to case. However, these civilian programs by themselves are considerably smaller than most military benefits.

Although military and civilian educational programs appear to offer competitive opportunities from the perspective of a high-quality youth considering enlistment or postsecondary education, from the perspective of a student with military financial aid benefits, these programs are not competing programs. Rather, there is significant interaction among these aid sources because the benefits may be bundled into a student's total financial aid package. It remains an important empirical question as to *how* military educational benefits affect the overall aid package: Do they displace grant aid that the student would have received absent military service—or do they displace loan aid? Additionally, it is important to understand that participation in the military changes one's dependency status, which in turn affects the determination of financial need and the allocation of financial aid.

Opportunities for Full-Time Enlistees in the Army, Air Force, Navy, and Marines

To attract high-quality youth, the services have offered several education programs as enlistment incentives. Four main financial programs are available in most or all of the services: MGIB, CF, LRP and TA. Two of these programs, MGIB and CF, generally subsidize education upon completion of the service agreement, and all are subject to various qualifications. CF qualification requires enrollment in the MGIB because a component of CF benefits is derived from the MGIB program. TA may be used only while the individual is on active duty. LRP becomes available to an individual only upon enlisting and is subject to other qualifications as well. The option to use LRP precludes future use of MGIB and subsequently CF benefits.[1]

This section describes those programs that facilitate undergraduate study for individuals enlisting with full-time obligations. An inventory of educational opportunities with the armed services, which includes programs for officers, may be found in Thirtle (2001). For detailed information on data collection methods and sources, see Appendix D.

Montgomery GI Bill (Active Duty). The MGIB (Active Duty) is a program administered by the Veterans Administration (VA) that provides education funds for persons entering active duty in the Army, Air Force, Marine Corps, or Navy for the first time after June 30, 1985. To be eligible for the MGIB upon leaving service, servicemembers must receive an honorable discharge.[2] Full-time National Guard duty performed after November 29, 1989, is also considered active duty.

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[1]The Navy also introduced a program in FY 1998 called the Associate Degree Completion Program (ACDP). The program was subsequently changed in July 1999. Although this program is currently small, the Navy is considering plans to expand it. This report does not discuss this program. It should also be noted that the Navy has other educational programs that are non-monetary. These are described in Thirtle (2001). For example, ship-board members can obtain classroom instruction, and in some cases, computerized self-paced instruction. All courses are free of charge and fully accredited. Similar programs exist in the other services.

[2]According to the *Federal Benefits for Veterans and Dependents* (Department of Veterans Affairs, 1998), discharges that are designated "under honorable conditions" and "general" will not suffice to establish eligibility for MGIB. MGIB benefits may be used while on active duty but at a significant penalty. Maximum MGIB benefits may be obtained upon separating from service.

To qualify for maximum MGIB (Active Duty) benefits, participants must serve for three years. However, one may also qualify for maximum benefits by serving two years of continuous active duty initially, followed by four years of Selected Reserve service, commencing within one year of active duty release. Individuals who serve at least three years of continuous active duty will qualify for the maximum benefit even if they were initially obliged to serve less than three years (U.S. Department of Veterans Affairs, 1998).

To participate in the MGIB, servicemembers must agree to a $100 per month pay reduction for one year. This contribution to the MGIB program is not refundable even if the individual does not use the benefit. To qualify, the servicemember must either have a high school diploma or equivalency certificate or have completed 12 credit hours toward a college degree prior to the first period of active duty. Under most circumstances, these benefits are available for ten years from the last date of discharge or release from active duty. Under some extenuating circumstances, extensions are available.

According to *Federal Benefits for Veterans and Dependents* (U.S. Department of Veterans Affairs, 1998), the following education and training is available under the MGIB:

1. Courses at colleges and universities that lead to an AA, BA, or graduate degrees, and accredited independent study.
2. Courses that lead to a certificate or diploma from business, technical, or vocational schools.
3. Apprenticeship or on-the-job training programs for individuals who are not on active duty.
4. Under certain conditions, correspondence courses.
5. Flight training for veterans with a private pilot's license who meet medical requirements for a commercial license throughout the duration of the training program.
6. Tutorial assistance benefits for veterans who are enrolled at least half time. Other training such as refresher and remedial courses may also be available.

7. Teacher certification programs that are state-approved.

Payment schedules for the MGIB for fiscal years (FYs) 1996–1998 are shown in Tables 3.1–3.3. Participants in the MGIB are also eligible for work-study programs offered through the VA.

Effective October 1, 1998, veterans enrolled in the active duty MGIB or reserve component began receiving a 20 percent increase in monthly benefits. This raises the maximum benefit to $19,008 (over 36 months) from the $15,834 award in FY 1997.[3]

The College Fund. The Army, Navy, and Marine Corps offer college fund programs as enlistment incentives to attract high-quality high school graduates into critical or hard-to-fill ratings or Military Occupation Specialties (MOS).[4] Tables 3.1–3.3 describe these programs for FYs 1996, 1997, and 1998. All amounts are in nominal dollars. In terms of funding, these three programs are structured similarly. The college funds are composed of two parts: the MGIB contribution and a "kicker." The kicker comprises the difference between the MGIB funds and the college fund amount guaranteed at the time of enlistment.

For a four-year obligation, the Army College Fund (ACF) is currently the most generous. For a four-year obligation, individuals may receive up to $40,000 for college studies.[5] Before March 1997, the maximum was $30,000. The larger benefit is restricted to particular MOS outside the normal MOS chart. Because this maximum ACF is highly restricted, there are concurrent and less restrictive ACF programs for two-year, three-year, and four-year commitments with significantly lesser benefit levels (see Tables 3.1–3.3).

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[3]Effective October 1, 1999, the maximum award was raised to $536 per month or $19,296 over four years.

[4]Depending on the service, different terminology is used to designate career fields or occupations: the Army uses the term MOS; the Navy uses the term "rating," the Air Force uses the terms Air Force Specialty Code (AFSC) or simply "career field." Throughout this report, we will use only MOS to suggest all terminology employed by the various services.

[5]In FY 1999 the maximum ACF was increased to $50,000. In this analysis, we use the FY 1998 maximums.

Table 3.1

Benefits for Full-Time Enlistments, FY 1996

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Army	Amount:	$14,998 maximum for obligation of three years or more $12,186 for obligation less than three years Lesser awards for part-time studies	Amount:	$30,000 for four-year enlistment $26,000 for three-year enlistment $20,000 for two-year enlistment	Amount:	$55,000 maximum	Amount:	Lower level: up to 7% of tuition; not to exceed (NTE) $60 per semester hour (SH) Upper level: up to 75%of tuition; NTE $85 per SH Voc-Tech: up to 75% of tuition; NTE $1300/FY Limited to 15 SHs/FY
	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	33 1/3 percent paid each year of active duty for three years	Duration:	While on active duty

Table 3.1 (continued)

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Air Force	Amount:	$14,998 maximum for obligation of three years or more $12,186 for obligation less than three years Lesser awards for part-time studies	Amount:	Air Force has no college fund	Amount:	No loan repayment program	Amount:	75% of tuition or $250 per SH Voc-Tech: up to 75% of tuition; NTE, $187.50 per SH Limited to 15 SHs/FY
	Duration:	Up to ten years upon leaving service	Duration:	NA	Duration:	NA	Duration:	While on active duty
Navy	Amount:	$14,998 maximum for obligation of three years or more $12,186 for obligation less than three years Lesser awards for part-time studies	Amount:	$30,000 maximum for four-year enlistment $25,000 maximum for three-year enlistment	Amount:	No loan repayment program	Amount:	Undergrad: 75% of tuition; NTE $2,500/FY No limit

Table 3.1 (continued)

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Navy	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	NA	Duration:	While on active duty
Marine Corps	Amount:	$14,998 maximum for obligation of three years or more $12,186 for obligation less than three years Lesser awards for part-time studies	Amount:	$30,000 for three- or four-year enlistment	Amount:	No loan repayment program	Amount:	Undergrad: Voc-Tech: 75% of tuition; NTE $2,500/FY. No limit
	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	NA	Duration:	While on active duty

SOURCE: Tuition assistance data for all services provided by Otto Thomas, Chief, DoD Continuing Education. Naval College Fund and MGIB information provided by Linda Thomas, MGIB Program Manager, and Carol Slone, Navy College Fund Coordinator, at the Bureau of Naval Personnel. Information on Army programs provided by Sara Rowley, Rubin Grega, and Martha Mraz, Education Incentive Branch, Army Continuing Education Services. Information on Marine Corps programs provided by Captain McClelland, HQMC, Division of Public Affairs, Media Officer. MGIB information provided by Giles Larrabee, Department of Veterans Affairs. Air Force information provided by Al Arrighi, Air Force Education and Training Division, Directorate of Personnel.

NOTE: All amounts given in nominal dollars.

Table 3.2

Benefits for Full-Time Enlistments, FY 1997

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Army	Amount:	$15,403 maximum for obligation of three years or more $12,515 for obligation less than three years Lesser awards for part-time studies	Amount:	Effective March 1997: For restricted MOS selected by DA outside normal MOS chart, these amounts are offered concurrently with those of FY95: $40,000 for four-year enlistment $33,000 for three-year enlistment $26,500 for two-year enlistment	Amount:	Prior to 3 February, $55,000 maximum; after 3 February, $65,000 maximum	Amount:	Lower level: $60 per SH or 75% of tuition, whichever is less Upper level: $85/SH or 75% of tuition, whichever is less 15 SH/FY per soldier
	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	33 1/3 percent paid each year of active duty for three years	Duration:	While on active duty

Table 3.2 (continued)

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Air Force	Amount:	$15,403 maximum for obligation of three years or more $12,515 for obligation less than three years Lesser awards for part-time studies	Amount:	Air Force has no college fund	Amount:	No loan repayment program	Amount:	75% of $250 per credit hour (CH) or 75% of tuition, whichever is less No CH limit
	Duration:	Up to ten years upon leaving service	Duration:	NA	Duration:	NA	Duration:	While on active duty
Navy	Amount:	$15,403 maximum for obligation of three years or more $12,515 for obligation less than three years Lesser awards for part-time studies	Amount:	$30,000 maximum for four-year enlistment $25,000 maximum for three-year enlistment	Amount:	No loan repayment program	Amount:	Undergrad: 75%; NTE $2,500

Table 3.2 (continued)

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Navy	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	NA	Duration:	While on active duty
Marine Corps	Amount:	$15,403 maximum for obligation of three years or more $12,515 for obligation less than three years Lesser awards for part-time studies	Amount:	$30,000 for three- or four-year enlistment	Amount:	No loan repayment program	Amount:	Undergrad: 75%; NTE $2,500/FY
	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	NA	Duration:	While on active duty

SOURCE: Tuition assistance data for all services provided by Otto Thomas, Chief, DoD Continuing Education. Naval College Fund and MGIB information provided by Linda Thomas, MGIB Program Manager, and Carol Slone, Navy College Fund Coordinator, at the Bureau of Naval Personnel. Information on Army programs was provided by Sara Rowley, Rubin Grega, and Martha Mraz, Education Incentive Branch, Army Continuing Education Services. Information on Marine Corps programs provided by Captain McClelland, HQMC, Division of Public Affairs, Media Officer. MGIB information also provided by Giles Larrabee, Department of Veterans Affairs. Air Force information was provided by Al Arrighi, Air Force Education and Training Division, Directorate of Personnel.

NOTE: All amounts given in nominal dollars.

Table 3.3

Benefits for Full-Time Enlistments, FY 1998

Service	Montgomery GI Bill	College Fund	Loan Repayment	Tuition Assistance
Army	Amount: $15,835 maximum for obligation of three years or more $12,866 for obligation less than three years Lesser awards for part-time studies	Amount: Effective March 1997: For restricted MOS selected by the Department of the Army outside normal MOS chart, these amounts are offered concurrently with those of FY95: $40,000 for four-year enlistment $33,000 for three-year enlistment $26,500 for two-year enlistment	Amount: $65,000 maximum	Amount: Lower level: $60/SH or 75% tuition, whichever is less Upper level: $85/SH or 75% of tuition, whichever is less Voc-Tech: up to 75% ; NTE $1300/FY Limit 15 SH/FY per soldier

Table 3.3 (continued)

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Army	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	33 1/3 percent paid each year of active duty for three years	Duration:	While on active duty
Air Force	Amount:	$15,835 maximum for obligation of three years or more $12,866 for obligation less than three years Lesser awards for part-time studies	Amount:	Air Force has no college fund	Amount:	No loan repayment program	Amount:	75% of $250/SH Voc-Tech: up to 75%, $187.50/SH Maximum 15 contact hours per week
	Duration:	Up to ten years upon leaving service	Duration:	NA	Duration:	NA	Duration:	While on active duty

Table 3.3 (continued)

Service	Montgomery GI Bill		College Fund		Loan Repayment		Tuition Assistance	
Navy	Amount:	$15,835 maximum for obligation of three years or more $12,866 for obligation less than three years Lesser awards for part-time studies	Amount:	$40,000 for nuclear field recruits (six-year obligation) $30,000 maximum for four-year enlistment $25,000 maximum for three-year enlistment	Amount:	In FY98, a $10,000 repayment program was introduced	Amount:	Undergrad: 75%; NTE $2500/FY Voc-Tech: up to 75%; NTE $1300/FY No limit
	Duration:	Up to ten years upon leaving service	Duration:	Up to ten years upon leaving service	Duration:	After first year, 33 1/3% or $1,500, whichever is greater, for three years	Duration:	While on active duty
Marine Corps	Amount:	$15,835 maximum for obligation of three years or more	Amount:	$30,000 for three- or four-year enlistment	Amount:	No loan repayment program	Amount:	Undergrad and Voc-Tech: 75%; NTE $2,500/FY No limit

Table 3.3 (continued)

Service	Montgomery GI Bill	College Fund	Loan Repayment	Tuition Assistance
Marine Corps	Amount: $12,866 for obligation less than three years Lesser awards for part-time studies Duration: Up to ten years upon leaving service	Duration: Up to ten years upon leaving service	Duration: NA	Duration: While on active duty

SOURCE: Tuition assistance data for all services provided by Otto Thomas, Chief, DoD Continuing Education. Naval College Fund and MGIB information provided by Linda Thomas, MGIB Program Manager, and Carol Slone, Navy College Fund Coordinator, at the Bureau of Naval Personnel. Information on Army programs was provided by Sara Rowley, Rubin Grega, and Martha Mraz, Incentive Branch, Army Continuing Education Services. Information on Marine Corps programs provided by Captain McClelland, HQMC, Division of Public Affairs, Media Officer. MGIB information also provided by Giles Larrabee, Department of Veterans Affairs. Air Force information was provided by Al Arrighi, Air Force Education and Training Division, Directorate of Personnel.

NOTE: All amounts given in nominal dollars.

To qualify for the ACF, individuals must meet the following criteria:

1. Have no prior service.
2. Enlist in the active-duty Army between July 1, 1985 and the present.
3. Have a high school diploma.
4. Score a 50 or higher on the Armed Forces Qualification Test (AFQT).
5. Enlist in a qualifying MOS.
6. Enroll and participate in the MGIB.
7. Enlist with the ACF as a part of the enlistment agreement (http://www-perscom.army.mil/tagd/aces/acf.htm).

In FY 1998, the Navy also introduced a $40,000 maximum college benefit for nuclear field recruits agreeing to six-year obligations.[6] In FY 1998, the Navy continues to offer $30,000 college fund benefits for four-year obligations and lesser awards for three-year enlistments. The college fund for the Marines offers $30,000 for three- or four-year obligations. At present, the Air Force does not offer a college fund enlistment incentive. As with the MGIB, college fund benefits may be used up to ten years after release from duty.

Loan Repayment. Before FY 1998, the Army was the only service to offer a loan repayment program (LRP). This program, available to enlisted personnel only, was intended as an incentive to attract Army enlistees with at least some college education (United States Army Regulation EC 621-1, cited by Thirtle, 2001). Before February 3, 1997, the maximum loan repayment amount was $55,000. After February 3, 1997, the Army repays one-third or $1,500 of an outstanding eligible loan, whichever is greater for each year of service up to $65,000. No interest or other charges accrued due to default will be paid (Thirtle, 2001). Furthermore, the Army will not repay loans that are in default. (See http://www-perscom.army.mil/tagd/aces/lrpfaq.htm.)

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[6]In FY 1999, the Navy College Fund was increased to $50,000 for nuclear field recruits and to $40,000 for non–nuclear field recruits.

To qualify for the program, an applicant must meet the following criteria:

1. Enter active duty between December 1, 1980 and September 30, 1980 or after 30 September 1982.
2. Be a non–prior service recruit.
3. Have a high school diploma.
4. Score 50 or higher on the AFQT.
5. Enlist in a specific critical MOS.
6. Disenroll from the MGIB.
7. Possess a qualifying loan (http://www-perscom.army.mil/tagd/aces/lrp.htm).

The following loans are eligible for LRP if they were acquired after October 1975 (See Thirtle, 2001, and http://www-perscom.army.mil/tagd/aces/lrp.htm):

- Stafford Loans
- Perkins Loans
- Federally Insured Student Loans
- Auxiliary Loans to Assist Students (ALAS)
- Parents' Loans for Undergraduate Students (PLUS)
- Supplemental Loans for Students
- Consolidated Loan programs.

In FY 1998, the Navy also introduced an LRP for enlisted personnel. This program was likewise intended to be an enlistment incentive to attract high-quality candidates into critical ratings, or occupations. The maximum amount to be repaid under this program is $10,000, and it requires a four-year enlistment. Like the Army's LRP, the Navy's will repay one-third or $1,500 of the outstanding principal at the time of enlistment, whichever is higher. Benefits will be paid only after the end of the first year of service.

According to "Enlisted Policy-Gram #21-98," provided by Department of the Navy, Navy Recruiting Command, the basic eligibility criteria for the Navy LRP are the following. The member must:

1. Be non–prior service.
2. Enlist or contract under a delayed enlistment agreement.
3. Enter on active duty after 1 July 1997.
4. Have a high school diploma.
5. Score 50 or above on the AFQT.
6. Enlist and remain in a critical LRP rating, subject to change of recruiting environment.

Loans that are eligible for the Navy LRP must have been incurred after October 1, 1975 and prior to enlistment. Eligible loans include loans from the following programs (Enlisted Policy-Gram #21-98, provided by Department of the Navy, Navy Recruiting Command):

- Guaranteed Student Loans/ Stafford Loans
- Federal Stafford/Ford Loans
- Federal Direct Loans, National Direct Student Loans for Students
- Federally Insured Student Loans
- PLUS
- ALAS.

Tuition Assistance. Prior to the Uniform Tuition Assistance program, effective October 1, 1998, there was tremendous variation in TA programs across the Department of Defense. Nevertheless, some general comments may be made about all of these TA programs and their coverage rates. For individuals who have not completed their high school diploma or high school equivalency diploma (GED), TA covers 100 percent of the costs for approved high school completion programs. For courses toward the completion of an undergraduate or graduate degree, TA covers no more than 75 percent of tuition and fees. Tuition assistance is available only for courses that are part of a program of study leading up to a post-secondary certificate or degree and is provided only for courses offered by accredited postsecondary

institutions. Personnel are eligible for TA as long as they are on active duty.

The above description, while general, belies the diversity that has typified TA programs across the services and across time. Tables 3.1–3.3 outline the variation in programs across the services and within the various services between FY 1996 and FY 1998. Two main areas of divergence are fiscal year course caps and dollar amount caps. For example, in FY 1998, both the Army and Air Force imposed credit hour caps whereas the Navy and Marine Corps did not. Although all programs adhered to the 75 percent ceiling, the services could impose additional monetary caps on their program. For instance, in FY 1998, for lower division courses, the Army paid $60 per semester hour or 75 percent of the tuition costs—whichever was less. The Air Force paid up to $187.50 per semester hour. Thus, under these varying programs, it was theoretically possible that students from differing services could sit in the same classroom and incur very different personal costs. Effective FY 1999, the DoD adopted a uniform TA policy by which all services pay 75 percent of tuition costs up to a maximum of $187.50 per credit hour. Although there are no limits imposed on the number of credit hours, this new uniform policy imposes a $3,500 annual monetary cap.

Opportunities in the Selected Reserves and National Guard

A West Point Study (United States Military Academy, 1997) argued that the Selected Reserve and National Guard offer packages that may be competitive when compared with programs offered by the active services. These programs might be attractive to potential recruits because they may simultaneously serve part-time and pursue their degrees. Not only do these programs provide funding for education, they also provide participants with a salary—perhaps making them seem like a "part-time job" for students.

Generally speaking, there are two federal sources of funding available to members of the Selected Reserve (of which the Army and Air National Guard are two components): MGIB Selected Reserve and Loan Repayment. There is also limited TA for the Army Reserve, which provides support for distance learning programs. Even though a federal TA program has not been funded for Selected Reserve members' traditional learning, nearly every state offers some sort of resi-

dent tuition assistance that guardspersons may use. Sometimes such programs exist for members of the Reserve as well. For instance, Louisiana offers 100 percent tuition for reservists (Conversation with the Human Resources Branch at Office of Chief, Army Reserve, June 1998). (See Appendix D for details about data collection methods and sources.)

Montgomery GI Bill Selected Reserve (MGIB-SR). To be eligible for the MGIB-SR, reservists (including National Guardspersons) must have begun a six-year obligation to serve in the Selected Reserve after June 30, 1985. Reservists must also complete the Initial Active Duty for Training (IADT). To be eligible for the MGIB-SR, reservists must have completed their high school diploma or equivalency prior to completing IADT and remain in good standing within a Selected Reserve unit. Unlike the benefits of the MGIB for active duty, these benefits may not be used upon departing from service. Reservists must use their MGIB benefits while serving in the Selected Reserve because benefits end ten years from the date the reservist qualified for the program or on the day the reservist leaves the Selected Reserves, whichever comes first. As with the active-duty MGIB, participants are eligible for work-study programs offered through the VA (U.S. Department of Veterans Affairs, 1998). Unlike the active duty MGIB, the program is offered at no cost to the participant.

In FY 1998, reservists in the Selected Reserve could receive up to $7,521 over 36 months.[7] As with active-duty MGIB, benefits are paid monthly during those periods the participant is enrolled in an eligible course of study. Table 3.4 indicates the maximum MGIB-SR benefits for FYs 1996–1998. However, effective June 1998, the Army Reserve instituted a new program, the MGIB kicker. This program provides an additional $350 per month, bringing the monthly benefit to slightly under $560 per month. Note that this program offers funding far in excess of the MGIB (Active Duty). The program provides funding in excess of $20,000 over 36 months, compared with $15,835 over 36 months offered through the MGIB (Active Duty). This program is not generally available—one must be in a priority unit and in a priority MOS. As of this writing, the Army Reserve had

[7] As of FY 2000, the MGIB-SR pays up to $9,180 over 36 months.

Table 3.4

Selected Reserve Benefits

Program	Applicable Services	FY 1996	FY 1997	FY 1998
MGIB	All Select Reserve Components Army Navy Air Force Marine Corps Coast Guard Army National Guard Air National Guard	Amount: $7,124 maximum, over 36 months for full-time studies Lesser awards for part-time studies Full- and three-quarter-time enrollees eligible for work-study program	Amount: $7,317 maximum, over 36 months for full-time studies Lesser awards for part-time studies. Full- and three-quarter-time enrollees eligible for work-study program	Amount: $7,521 maximum, over 36 months for full-time studies Lesser awards for part-time studies Full- and three-quarter-time enrollees eligible for work-study program See text for details on MGIB Kicker effective June 1998

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Table 3.4 (continued)

Program	Applicable Services	FY 1996		FY 1997		FY 1998	
		Duration:	Benefit ends either on the day of separation or ten years after participant qualifies, whichever comes first	Duration:	Benefit ends either on the day of separation or ten years after participant qualifies, whichever comes first	Duration:	Benefit ends either on the day of separation or 10 years after participant qualifies, whichever comes first
Loan Repay-ment	Army Reserve Army National Guard Air National Guard	Amount:	$10,000–20,000, depending on MOS and determination of needed skills Guards pay up to $10,000	Amount:	$10,000–20,000, depending on MOS and determination of needed skills	Amount:	$10,000–20,000, depending on MOS and determination of needed skills

Table 3.4 (continued)

Program	Applicable Services	FY 1996	FY 1997	FY 1998
Loan Repayment	Army Reserve Army National Guard Air National Guard	Duration: For each year of satisfactory service, 15% of the original balance plus interest unpaid by the Department of Education or $500 plus interest, whichever is greater	Duration: For each year of satisfactory service, 15% of the original balance plus interest unpaid by the Department of Education or $500 plus interest, whichever is greater	Duration: For each year of satisfactory service, 15% of the original balance plus interest unpaid by the Department of Education or $500 plus interest, whichever is greater

SOURCE: MGIB data obtained from the Department of Veterans Affairs, Education Service. Information on the Army Reserve Loan repayment taken from the *Reserve Forces Almanac*, 1996, 1997, and 1998. This information was confirmed by the Human Resources Branch at Headquarters Office of Chief Army Reserve (OCAR).

the only program that offered this level of incentive for Selected Reserve participation. The remaining services utilized the basic MGIB-SR benefit (Conversation with Incentives Office, Office of the Chief, Army Reserve, June of 1998).[8]

As with the MGIB (Active Duty), effective October 1, 1998, members of the Selected Reserves received a 20 percent increase in monthly MGIB-SR benefits.[9]

Loan Repayment. We tried to verify the existence of loan repayment programs in the various reserve components described in the *Reserve Forces Almanac*. We were able to confirm only that the Army Reserve, Army National Guard, and Air National Guard use this program.

Depending upon the MOS contracted, the Army Reserve program repays up to a maximum of $10,000 to $20,000. Table 3.4 summarizes loan repayment levels for FYs 1996–1998. (The maximums are not regulated, but once an LRP amount of $10,000 dollars is established for a soldier, it cannot be increased to $20,000 during the soldier's career.) For each year of satisfactory service, 15 percent of the original balance plus interest unpaid by the Department of Education or $500 plus interest not paid by the Department of Education will be paid, whichever is greater (United States Army Regulation 135-7, 1994).

This incentive provides for the repayment of loans secured after October 1, 1975 from the following programs:

- Stafford Loans (formerly Guaranteed Student Loans)
- Federally Insured Student Loans
- Perkins Loans (formerly National Defense Student Loans and National Direct Student Loans)
- Auxiliary Loans to Assist Students
- PLUS (provided the soldier is the student using the loan)
- Supplemental Loans for Students

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[8]Subsequently, the other Reserve Components have begun utilizing this kicker to varying degrees.

[9]http://www.defenselink.mil/news/Jul1998/n07131998_9807136.html, accessed August 1998.

- Consolidated Loan Program.

According to United States Army Regulation 135-7, a reservist becomes eligible for the LRP upon meeting the following criteria:

1. Has completed IADT.
2. Is MOS-qualified or has received sufficient training to be deployed.
3. Has a high school diploma or equivalent.
4. Has served one year in the Selected Reserve upon securing the loans in question.
5. Has reached the anniversary date of the Selected Reserve contract for LRP participation.

To participate in the LRP, reservists contractually agree to serve satisfactorily for the full term of the obligation. They further obligate themselves to continue to serve in the same MOS unless excused for the government's convenience (United States Army Regulation 135-7, 1994).

Entitlement to the program ends if the reservist completes the contracted term of service, is reclassified into a skill ineligible for the program, does not satisfactorily perform for the full term of his or her enlistment, or accepts a civilian job where membership in the Selected Reserves is a condition of employment (United States Army Regulation 135-7, 1994).

Both the Air National Guard and Army National Guard offer LRP programs that will repay up to $10,000 in student loans for enlisted personnel. The details of the National Guard LRP programs have varied considerably over the past several years.

Special Programs for the National Guard. Apart from programs available to all or several components in the Selected Reserve, there are specific programs available to members of the Air or Army National Guard. Educational assistance for the National Guard may come from both state-funded and federally funded programs. With respect to state-funded programs, TA for the National Guard varies extensively across the states and territories. Table 3.5 presents a

breakdown of states and territories offering tuition assistance to members of the Army and Air National Guard.[10] It demonstrates that the vast majority of states offer some type of tuition assistance to members of the National Guard.

Federal educational benefits for the Army National Guard include tuition assistance (Conversation with Education Service Officer, National Guard Bureau in July, 1998). According to the Education Officer at the National Guard Bureau, there are two tuition assistance policies. One policy provides for traditional, classroom-based courses. It will cover 75 percent of tuition or up to $100 per credit hour, whichever is less, for undergraduate courses. An individual may take up to 15 credit hours per fiscal year. Another policy provides for distance learning programs. It pays for 75 percent of tuition up to $2,000 per fiscal year and up to 15 credit hours per fiscal year.[11] As of FY 1998, the Air National Guard did not fund these federal TA programs.

Federal Financial Aid Programs

In this subsection, we focus on federal student financial aid programs, which include Pell Grants, Supplemental Educational Opportunity Grants (SEOG), subsidized and unsubsidized Stafford Loan programs, PLUS, Perkins Loans, and State Student Incentive Grants. We also look at educational opportunities provided by the Taxpayer Relief Act of 1997. (See Appendix D for detailed information about data collection methods.)

Our conversations with policymakers and members of the defense community suggest that there is considerable misunderstanding about federal financial programs, particularly the Pell Grant. (For ex-

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[10]Some states offer multiple programs simultaneously. Program details vary. Some programs are for in-state schools only. Some are restricted to undergraduate studies. Others fund associate degrees at different rates than baccalaureates. Some have merit-based or need-based criteria. As noted, some programs offer loan forgiveness *in lieu* of tuition assistance.

[11]Eligibility for these programs is unclear. While the regulations state that active duty Guardsmen are eligible, the Education Officer at the National Guard Bureau maintained that the "weekend Guardsperson" is also eligible (Conversation with Education Officer, National Guard Bureau, July 1998).

Table 3.5

Summary of State-Based Maximum Tuition Assistance Available for Members of the National Guard, FY 1998

States Providing No TA	States Providing Partial TA or "Full TA" Subject to Caps	States Providing Full TA or Tuition Waivers
Arkansas[a]	Alabama	Connecticut
California	Alaska	Delaware
Georgia[b]	Arizona	Illinois
Guam	Colorado	Kansas
Idaho	D.C.	Kentucky
Indiana	Florida	Louisiana
Maine	Hawaii	Massachusetts
Michigan	Iowa	New Hampshire
Montana[a]	Maryland	New Jersey
New Mexico	Minnesota	New York
Oregon	Mississippi	North Dakota
Tennessee	Missouri	Oklahoma
Texas	Nebraska	Washington
Vermont	Nevada	West Virginia
Wyoming	North Carolina	Wisconsin
	Ohio	
	Pennsylvania	
	Puerto Rico	
	Rhode Island	
	South Carolina	
	South Dakota	
	Utah	
	Virgin Islands	
	Virginia	
N = 15	N = 24	N = 15

SOURCE: Personal Communication, National Guard Bureau, August 1998.

[a]Program is currently not funded.

[b]Program available is a loan-forgiveness program.

ample, several individuals have asserted that MGIB benefits preclude one from obtaining a Pell Grant.) To address these concerns, we next undertake a comprehensive discussion of financial aid eligibility.

Over the past decade, appropriations for the federal grant programs—Pell and Supplemental Educational Opportunity Grants—have grown only slightly in constant dollars. More generally, a survey of the landscape of civilian financial aid programs reveals an important trend: Financial aid programs are shifting away from grants toward loans. This shift *could* have important implications for military

education programs. Students may weigh the prospect of heavy loan debt against the opportunities available in the armed services. Perhaps military loan forgiveness programs may be made more attractive to debt-laden graduates or dropouts seeking loan-repayment and career opportunities. However, such optimistic speculation about this shift in aid and the impact on recruitment is dampened by the findings in Chapter Two: Despite the shift in financial aid from grants to loans, youth intention to enlist has dramatically diminished while their intention to pursue postsecondary education has increased.

Overview of the Financial Aid Landscape. The federal government is the most significant source of financial aid. Yet appropriations for the Pell and SEOG grant programs have grown little over the past decade, while eligibility has been expanded. Although this has resulted in more awards, the average award has actually declined (The College Board, 1997, Lee and Clery, 1997). Table 3.6 presents data on the program maximums and average awards for AY 1995–1996 and AY 1997–1998. It is important to keep in mind that there are numerous other sources of funding in addition to federal programs—state aid, foundation aid, various merit-based programs, and institutional aid, among others.

State programs are much smaller sources of funding, providing only 6 percent of total student aid. Yet, after adjusting for inflation, state aid has grown by 50 percent over the past ten years. However, Congress reduced federal matching of state need-based grants through the State Student Incentives Grants (SSIG) program by 50 percent in 1996–1997. Although the program was restored in 1997–1998, the appropriations were again halved in FY 1998 (i.e., AY 1998–1999) (The College Board, 1997, 1998, and Lee and Clery, 1997).

The fastest-growing source of aid has been institutional aid, which has doubled since AY 1987 (The College Board, 1997 and Lee and Clery, 1997). Lee and Clery (1997) posit that educational institutions are funneling discretionary income generated by tuition increases into financial aid packages. Thus, institutional aid may be a mechanism of cross subsidization of students who have lesser financial ability to pay by students who can afford the stated costs of attendance. Rose and Sorensen investigated the claim that institutions

Table 3.6

Federal Student Aid Levels
(Maximum and Average Awards per Funded Student)

Program Name	AY 1995–1996	AY 1997–1998
Pell Grant		
Maximum	$2,340	$2,700
Average	$1,501	$1,698
SEOG		
Maximum	$4,000	$4,000
Average	$697	$727
Federal Work Study		
Maximum	Not specified	Not specified
Average	$1,307	$1,215
Total Stafford Loans for undergraduates		
Maximum	$10,500 (up to $5,500 may be subsidized)	$10,500 (up to $5,500 may be subsidized)
Average	$3,889	NA
Subsidized Stafford Loans for undergraduates		
Maximum	$5,500	$5,500
Average	$3,062	$3,493
Unsubsidized Stafford Loans for undergraduates		
Maximum	$10,500	$10,500
Average	$2,908	$3,791
PLUS Loans		
Maximum	COA minus other financial aid amounts	COA minus other financial aid amounts
Average	$5,817	$6,285
Perkins Loans		
Maximum	$3,000 ($15,000 cap in undergraduate career)	$3,000 ($15,000 cap in undergraduate career)
Average	$1,386	$1,564
SSIG		
Maximum	$5,000 (varies by state)	$5,000 (varies by state)
Average	NA	NA

SOURCE: All average figures for 1995–1996 are from U.S. Department of Education (1996). Average Pell Grant, Federal Supplemental Educational Opportunity Grants (FSEOG), and Work-Study award for AY 1997–1998 are from the *Statistical Abstract, 1999*. All program maximums are from U.S. Department of Education (1995 and 1997a).

NOTE: All amounts in nominal dollars. COA = cost of attendance.

charge high tuition to subsidize needy students, a practice that is "observationally equivalent to ordinary price discrimination" (Rose and Sorensen, 1992, p. 66). Their findings suggest that whatever cross-subsidization occurs is likely to occur in a highly targeted way that does not benefit all needy students equally. As discussed next, institutional aid is highly dependent on the type of school and type of institutional control, with institutional aid awards increasing along with the size of the institution's endowment (U.S. Department of Education, 1997d).

Financial aid has a broad base of recipients. During AY 1995–1996, nearly 50 percent of all undergraduates received some type of financial aid, averaging $4,926 (U.S. Department of Education, 1997d). The percentages of students receiving federal aid varied with the family income, type of institution,[12] and whether the student was dependent or independent. Among dependent undergraduate students, 63 percent of students from families with incomes of less than $20,000 received federal aid and 13 percent of students from families with income of $100,000 or more received aid. Among independent undergraduates with incomes of $10,000 or less, 58 percent received some type of federal aid. Among students attending less than two-year public institutions, 16 percent received federal aid compared with 71 percent of undergraduates at private, for-profit, two-year or higher institutions. Forty-five percent of the students attending four-year public schools received federal aid and 52 percent of the students at four-year private schools received such aid (U.S. Department of Education, 1997d).

There has been an important philosophical shift in financial aid: Over the past decade, financial aid has tended to move from grants to loans (Grubb and Tuma, 1991, The College Board, 1997, King, 1996). Since 1992–1993, student debt has increased by more than 50 percent, as a result of changes in the 1992 reauthorization of the Higher Education Act (King, 1996). Specifically, King (1996) posited the following causes for the observed growth in student debt:

- Increased borrowing limits.

[12]Cost of attendance varies with the type of institution attended. Therefore the determination of unmet need will also vary with the type of school attended.

- New method of calculating the Expected Family Contribution, which resulted in more middle-income families becoming eligible for federal need-based programs, including Federal Stafford Loans.
- The establishment of a new, unsubsidized loan program available to all students regardless of financial need. These loans now comprise one-third of federal loan volume. The rapid growth of this program accounts for nearly 50 percent of the increase observed in student loan volume.

Oddly, as King notes, the increase in loan volume far exceeds actual increases observed in cost of attending either private or public schools. Thus, King argues, this increase in loan volume must be attributable to other factors. King puts forth the possibility of intergenerational transfer of fiduciary responsibility for financing postsecondary education. She suggests that students are taking out unsubsidized loans at least in part because of parents' unwillingness to plan ahead for college. She cites as evidence the decreasing numbers of PLUS Loans. King notes that this correlation is obviously obfuscated by private informal arrangements whereby parents assist their children. She also raises the possibility that middle-income undergraduates are taking out loans irresponsibly.

One response to King's conclusions is that she does not comment upon the growth of the average loan package, the fraction of loans in the total student aid package, or the numbers of students taking on debt. It may be that more students are willing to take out loans, thus contributing to expanding loan volume. Increased willingness to borrow may be explained by the literature examining the demand for higher education and returns to human capital investment in the labor market (Becker, 1997). Growth in demand for higher education, despite soaring costs, principally reflects the increasing returns to education realized in the labor market. For instance, the college premium (the percentage difference in average real wages between a four-year college graduate and a high school graduate) increased from 40 percent in 1979 to 65 percent in 1995 (Mishel, Bernstein, and Schmitt, 1997). This increase in the college premium is mostly attributed to the precipitous drop in wages among those without college degrees. Thus, as the return to educational investments grows (and the penalties for not making educational investments grow), so

may the willingness to pay for educational investments. More people may be willing to take on loans to finance this investment.

For King, this shift from grants to loans is significant because of the impact these funding policies have on low-income students: As the purchasing power of grants declines, low-income students have a diminished option set. For this study, we speculate that as financial aid continues to shift from grants to loans, programs such as military education incentives become even more important in the landscape of financial aid options. For instance, a young person may weigh the disadvantages of taking on a significant loan burden against enlisting in the military. Alternatively, graduates or college dropouts with significant debt may consider the military loan forgiveness programs.

Federal Programs of Interest. Having discussed briefly some of the significant trends and changes in the financial aid landscape, we now focus on federal financial aid programs, which are the largest sources of aid. Although we recognize the importance of other programs, a systematic evaluation of various state aid programs, foundation initiatives, and institutional aid policies is not a tractable task within the scope of this study.

We detail the application procedures and the qualification criteria for the following federal financial aid programs: Pell Grants, SEOG, subsidized and unsubsidized Stafford Loan programs, PLUS, Perkins Loans, and State Student Incentive Grants. We also discuss the Hope Scholarship and the Lifetime Learning Tax credit, part of the Taxpayer Relief Act of 1997, even though they are not considered federal financial aid programs. Rather, as their names suggest, they are tax credits and have no formal application procedure.

Qualifying for Federal Financial Aid Programs: The Free Application for Federal Student Aid. All federal financial aid programs except unsubsidized loans under certain programs require students to demonstrate financial need. For federal financial aid programs, financial need is determined by the following formula:

Financial Need = (Cost of Attendance) – (Expected Family Contribution).

Each of these components will be addressed below. To determine eligibility, students must apply for federal financial aid programs by completing the Free Application for Federal Student Aid (FAFSA). The information obtained from the FAFSA includes data on the student's dependency and/or marital status, household income and assets, availability of veterans' benefits, and the number of children attending college. Scholarships obtained from other sources are not reported on the FAFSA. These data are used in formulae established by the U.S. Congress to determine the expected family contribution (EFC) and the annual cost of attendance (COA). The formula to determine EFC varies with the student's dependency status (*1997–1998 Student Guide*, U.S. Department of Education, 1997a).

Several additional basic eligibility requirements must be met to qualify for federal financial aid. According to *The 1997–1998 Student Guide*, a student must:

1. Demonstrate financial need. (Some loan programs are exempt from this qualification.)
2. Have a high school diploma, GED, or other equivalent.
3. Be enrolled (or accepted for enrollment) as a regular student working in an eligible program toward attaining a degree.
4. Have U.S. citizen or be an eligible noncitizen.
5. Possess a valid social security number.
6. Progress academically with satisfactory progress.
7. Sign a statement of educational purpose as well as a certification statement pertaining to overpayment and default.
8. Comply with applicable obligations to register with the Selective Service.

Calculation of EFC. As described above, the determination of EFC is based upon information reported in the FAFSA. According to the 1997–1998 *Student Financial Aid Handbook* (U.S. Department of Education, 1997c):

> The EFC is the amount that a family can reasonably be expected to contribute toward college costs. The EFC is based on an analysis of

> the family's financial strength, including the income and assets of the student and student's spouse or—if the student is a dependent—the student and his or her parents.

The EFC also takes into consideration the number of persons in the household, the number of persons in college, and any additional costs incurred by families wherein both heads of household work. Significantly, for federal financial aid programs, veterans' educational benefits are considered a resource—*not income*—in determining the level of financial need (U.S. Department of Education, 1997c). We will return to the treatment of resources below. This means that veterans' *educational* benefits are not included in EFC calculations as they are neither assets nor income. As we discussed below, the implication of this accounting is that veterans' educational benefits do not affect Pell Grant eligibility. However, veterans' *noneducational benefits* (Death Pension and Dependency and Indemnity Compensation benefits) and income earned from the Veterans Administration Student Work-Study Allowance Program are included in the EFC as nontaxable income (U.S. Department of Education, 1997c).

The appropriate worksheet used to calculate a student's EFC is determined by dependency status. According to the 1997–1998 *Student Financial Aid Handbook,* a student is considered to be independent if he or she meets any of the following criteria:

- Was born prior to January 1, 1974. (The student must be 23 years of age before January 1 of that academic year.)
- Is a veteran of the United States Armed Forces.
- Will be enrolled in a graduate or professional program, beyond a bachelor's degree.
- Is either a ward of the court (or was a ward of the court until age 18), or both parents are deceased and the student has no adoptive or legal guardian. A student is not considered a ward of the court only because he or she is incarcerated.
- Is married.
- Has legal dependents other than a spouse.

For the purposes of this study, it is important to note that veteran status confers to the student the status of independent student. This change in status affects the method by which EFC is calculated and subsequently affects the determination of a veteran's financial need. We explain this issue more fully below.

EFC Calculation for the Dependent Student. For the dependent student, the EFC has two components: the portion from parental income and assets (excluding the family's home) and the portion from the student's income and assets. In calculating the parental contribution, 12 percent of the parental assets are added to the income determined to be available for financing their child's education. This amount is divided by the total number of children in college for that particular academic year. This is the parental contribution to the EFC. Student contribution is calculated by taking 50 percent of his or her assets and adding this amount to the student's income that is assessed to be available. The EFC is the sum of both the parental and student contributions (U.S. Department of Education, 1997b).

EFC Calculation for the Independent Student. For the independent student, the EFC is calculated based upon the student's household income and assets.[13] Different worksheets are used if the student has dependents other than a spouse. For the student without dependents other than a spouse, the EFC is derived by taxing assets (excluding the family home) at a rate of 35 percent and adding to that sum the income assessed to be available for college expenditures. This sum is divided by the number of persons in college during the relevant academic year. For those with dependents other than a spouse, the asset conversion rate is only 12 percent. Note that across these different statuses, there are differential income protection allowances that vary with dependency status, marital status, and with having dependents other than a spouse (U.S. Department of Education, 1997b).

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[13]The Higher Education Act Reauthorization (HEAR), signed into law in October 1998, increases the income protection allowance (IPA) for independent students without dependents other than a spouse. The HEAR changes to the IPA became effective in AY 2000–2001 (Department of Education, Forecasting and Policy Analysis Unit, personal communication in October, 1998).

The differential rates of asset conversion may generate different incentives. First, dependent students' assets are "taxed" at a much higher rate than are those of their parents (50 percent versus 12 percent). Thus, there may be less incentive to place assets in the student's name. This disincentive to place assets in the child's name could be offset by the federal and state tax obligations imposed upon the parents if the assets are in their name. This is necessarily driven by the amount of assets in question, how long the assets are held, and the parents' tax bracket. Second, the EFC for the student who does not work is lower than the EFC for the working student. Thus, there is a distinct disincentive for student employment or for accumulation of student assets. As students becomes independent, e.g., through military service, they have a much decreased asset conversion rate. However, they may have more income and assets to contribute to their college expenses. Understanding the implications of this change in dependency status upon a veteran's ability to qualify for federal financial aid is crucial to understanding the impact of veterans' benefits upon the total financial aid package composition. Although estimating the effects of this change in status on program eligibility is beyond the scope of this investigation, doing so would contribute a great deal to understanding veterans' educational benefits.

The Cost of Attendance. The COA is also a factor in assessing student financial need. This COA is determined by methods established by Congress. The COA includes the following: tuition and fees, on-campus room and board (or a housing and food allowance for off-campus students) allowances for books and supplies, transportation, loan fees (if applicable), dependent care, costs related to disability, and miscellaneous expenses. For less than half time attendance, the COA only includes tuition and fees, books and supplies, transportation, and dependent care expenses (U.S. Department of Education, 1997b).

Federal Financial Aid Program Eligibility. For purposes of Pell Grant eligibility, the student's financial need is simply the difference between the COA and the EFC. For programs other than the Pell, additional considerations are included. According to the 1997–1998 *Student Financial Aid Handbook*, before allocating aid from campus-based programs, the financial aid administrator must take into consideration all other resources available to the student. Thus, for

all other programs, the maximum amount of aid to be received by campus-based programs is given by the following formula:

Maximum aid from campus-based programs = (Financial need) – (Aid from other resources and federal financial aid programs).

According to *The 1997–1998 Federal Student Financial Aid Handbook*, resources, as defined by campus-based financial aid regulations, include but are not limited to the following:

- Pell Grant funds
- Other federal financial aid grants and loans
- Scholarships (e.g., athletic scholarships and ROTC)
- Tuition and fee waivers
- Fellowships or assistantships
- Veterans' educational benefits
- Income from insurance programs that pay for students' education
- Net income from need-based employment.

Thus, while veterans' education benefits *are not* considered in determining Pell eligibility, they *must be* considered in allocating aid for all other federal financial aid programs, with one recent exception. This exception has resulted from The Higher Education Act Reauthorization of 1998, which stipulates that active-duty MGIB benefits are not to be considered in the determination of subsidized Stafford Loan eligibility. Consequently, although veterans' benefits do not affect Pell Grant receipt, they are likely to affect the allocation of most other federal financial aid awards.[14]

The Pell Grant Program. The Pell Grant is awarded to undergraduates who have not earned a BA or professional degree. It is often the foundation on which other types of aid are layered. Significantly, the Pell Grant is the only federal program for which there is a federally

[14]These resources may also affect the allocation of state and institutional funds as well. The present analysis cannot address these issues.

guaranteed maximum. Moreover, should the student receive other sorts of aid that when taken together with the Pell Grant exceed the COA, the Pell Grant cannot be diminished. The program functions as an entitlement (Conversations in March and July 1998 with the Department of Education Forecasting and Policy Analysis Unit). This fact, as we will see below, may have important consequences for veterans.

Pell Grant awards are determined by disbursement schedules. These schedules are matrices whose coordinates are the EFC and the COA. There are different schedules for full-time, three-quarters-time, half-time, and less than half-time courses of study. Thus, Pell Grant eligibility and award size depend upon EFC, COA, and whether one is a full-time student. According to the appropriations for the Federal Pell Grant Program for 1997–1998, the maximum award was $2,700 (in nominal dollars).[15] This maximum award was granted to students whose EFC was zero and whose COA was $2,700 or more. The maximum EFC beyond which one could not qualify for a Pell Grant, regardless of the COA, was $2,500. The minimum award was $400 and was available for several combinations of COA and EFC. In general, Pell Awards tend to be smaller as EFC approaches the $2,500 maximum and/or as COA tends toward zero. Pell awards tend to be larger as EFC moves toward zero and/or COA approaches or exceeds $2,700 (POL-97-1, provided by the Department of Education, Forecasting and Policy Analysis Unit).

It should be noted that there are significant differences between the maximum Pell award and the average award. For example, in AY 1995–1996, the maximum award in nominal dollars was $2,340 whereas the average award was only $1,501 (U.S. Department of Education, 1996). See Table 3.6 for the maximum award for AY 1995–1996 and AY 1997–1998 as well as average award data for AY 1995–1996.

State Student Incentive Grant Program. The SSIG is a matching program whereby each state receives an annual allocation of SSIG funds from the Department of Education. This program assists states in providing students who demonstrate financial need with grants for

[15]The maximum Pell Grant award was $3,000 (nominal dollars) in AY 1998–1999 and $3,125 in AY 1999–2000 (nominal dollars).

postsecondary studies. A percentage of these funds may be used by the state to provide work-study assistance through community-service programs. However, there is extreme variation across states in terms of funding, student eligibility, institution eligibility, and program name. Significantly, although states are not required to include proprietary (for-profit) schools in their programs, 25 states currently make SSIG funds available to students attending such schools. Moreover, while the maximum award that a student may receive is $5,000, in fact, most states set maximums that are significantly lower (U.S. Department of Education, 1997c).

Campus-Based Federal Financial Aid Programs: SEOG, Federal Work-Study, and Perkins Loan Programs. Three federal financial aid programs are campus-based: SEOG, Federal Work-Study, and Perkins Loan Programs. They are called "campus-based" because they are administered directly by the financial aid office at each participating school (although not all schools participate in these programs). The three programs are very different, but they do have some features in common. For all of them, the amount awarded depends on financial need, on the amount received from other sources of aid, and on the amount of funds available at the school in question. Unlike the Pell, these programs do not have federally guaranteed maximums. Every year, participating schools are allocated a certain amount of funds; when they are exhausted, no additional awards can be made for that program for that academic year. Thus, not every eligible student will receive aid from these programs (U.S. Department of Education, 1997a). The local control of the disbursement of these funds also implies that at the extremes, a school receiving these funds may choose to fund as many students as possible with smaller grants *or* award larger grants to the most needy. The allocation of the funds depends upon the funding objectives of the institution as well as the amount of funds received. Each school has its own set of deadlines and application procedures for aid (U.S. Department of Education, 1997a).

The Federal SEOG also allocates grant aid consistent with the eligibility described above. Pell Grant–eligible students are supposed to be given priority in distribution of SEOG awards, however (U.S. Department of Education, 1997a). In AY 1997–1998, the maximum award was $4,000, considerably in excess of the Pell maximum. However, as with the Pell, there is a considerable difference between the

maximum and average award: In AY 1995–1996, the average SEOG award was only $697 whereas the maximum was $4,000 (U.S. Department of Education, 1996).

The federal work-study program provides both undergraduates and graduate students with employment. Federal work-study jobs pay at least the minimum wage and are available both on and off campus. Federal work-study awards depend upon the following variables: the time one applies, the level of need, and the funding available at one's school. Although there is no federally regulated maximum award, one cannot earn beyond the federal work-study aid amount determined by the financial aid office. In AY 1995–1996, the average work-study award was $1,307 (U.S. Department of Education, 1996).

The Perkins Loan Program offers low-interest loans (at a constant rate of 5 percent) to both undergraduate and graduate students who demonstrate exceptional need. Although the federal government is the source of these funds, the school is the lender and the loans must be repaid to the school. The maximum amount one can borrow through this program varies depending upon the time of application, the level of need, and the funding level of the school. In AY 1997–1998, one could borrow up to $3,000 per each year of undergraduate study, not to exceed $15,000 for total undergraduate work. As Table 3.6 shows, the maximum loan for the Perkins Loan program did not change in nominal dollars between AY 1995–1996 and AY 1997–1998—which means that in real dollars, the maximum loan decreased. Also, as with other federal awards, there are significant differences between the maximum award and the average award: In AY 1995–1996, the average award was only $1,386 compared with the $3,000 maximum (U.S. Department of Education, 1995; 1996). Repayment of these loans typically begins nine months after leaving school or dropping below half-time status. One has up to ten years to repay these loans (U.S. Department of Education, 1997a).

Direct and FFEL (Federal Family Education Loan) Stafford Loans. According to *The 1997–1998 Student Guide,* "Direct and FFEL Stafford Loans are the Department's [of Education] major form of self-help aid." The primary differences between Direct and FFEL Stafford Loans are the sources of funding, application details, and terms of repayment. Direct Stafford Loans are available through the William D. Ford Federal Direct Loan Program, and the FFEL Stafford

Loans may be obtained from the Federal Family Education Loan Program. Whether Direct or FFEL, Stafford Loans (formerly called Guaranteed Student Loans) can take two forms: subsidized and unsubsidized. Subsidized loans are allocated on the basis of demonstrated need and no interest is paid prior to the commencement of repayment or during periods of deferment. During these periods the federal government subsidizes the interest. Conversely, unsubsidized loans are not distributed according to need and recipients are charged interest from the time the loan is disbursed. The interest rate for both subsidized and unsubsidized loans will vary with fluctuations in the federal treasury bill interest rate, but it cannot exceed 8.25 percent. There is a fee of up to 4 percent of the value of the loan, which is deducted proportionately from each (U.S. Department of Education, 1997a).

If one is enrolled in a program to obtain a degree or certificate and is attending at least half time, one may be eligible for a Stafford Loan. Maximum borrowing limits depend upon whether one is dependent or independent. According to *The 1997–1998 Student Guide*, dependent students had the following yearly borrowing constraints in AY 1997–1998:

- $2,650 for first-year students enrolled at least full time
- $3,500 for those who have completed the first year of study and have at least one full academic year of the program remaining
- $5,500 for those who have completed two years of study and have at least one full year remaining.

Independent undergraduates or dependent students whose parents could not obtain a PLUS Loan had the following yearly borrowing constraints in AY 1997–1998:

- $6,625 for first-year students enrolled full time ($2,650 may be in subsidized loans)
- $7,500 for those who have completed the first year of study and have at least one full academic year remaining (only $3,500 may be subsidized)

- $10,500 for those who have completed two years of study and have at least one full academic year remaining (only $5,500 may be subsidized) (U.S. Department of Education, 1997a).

For periods of study that are less than full time, lower borrowing constraints are imposed. Graduate students have higher limits for borrowing. Loans disbursed after July 1, 1994 have the same interest rate and 4 percent fee as described (U.S. Department of Education, 1997a).

As in the case of all other federal programs, except the Pell, the nominal dollar amounts of these programs did not change between AY 1995 and AY 1997. Thus, controlling for inflation, the real purchasing power of these programs diminished. Also, note the comparison between the average subsidized Stafford and unsubsidized Stafford and the maximums for both loan types in AY 1995–1996. (Refer to Table 3.6.) The average is considerably lower than the maximum. The average awards reported and the stipulated maximums are not truly comparable, however, because the average is a composite of individual loans with various borrowing constraints imposed. The average loan award is not broken out according to the tiers of borrowing limits (U.S. Department of Education, 1997a, and U.S. Department of Education, 1996).

PLUS Loans for Parents. Upon passing a credit check, parents may qualify for a PLUS Loan. Those who do not pass the credit check may still be eligible under some circumstances. Parents must also meet some of the general requirements for federal financial aid, such as citizenship requirements, and must not be in default or owe a refund to any federal financial aid program. In general, the borrowing constraint for the PLUS program is the annual COA minus any other financial assistance received by the student. For all practical purposes, parents may consider PLUS as a replacement for the EFC. The interest rate for this loan varies with the fluctuations in the federal treasury bill rate but cannot exceed 9 percent. A fee equal to 4 percent of the amount of the loan is assessed and deducted proportionately from each loan disbursement (U.S. Department of Education, 1997a).

The HOPE Scholarship and Lifetime Learning Tax Credits. On August 5, 1997 President Clinton signed into law the Taxpayer Relief Act

of 1997, which provided for both the HOPE Scholarship and Lifetime Learning Credits. These programs are not grants or loans; rather, as the enabling legislation suggests, they are a form of tax relief. As such, they involve no application procedures. Broadly speaking, the Relief Act creates a tax credit of up to 100 percent of the first $1,000 of tuition and 50 percent of the second $1,000. This tax credit is available to any taxpayer, either parent or student, who is making qualified educational expenditures. Taxpayers may take this credit for their own expenses or for the expenses of their spouses or dependent children (U.S. Department of Education, 1997e). Since December 31, 1997, this credit has been available on a per-student basis for net tuition and fees (less grant aid and military benefits)[16] paid for college enrollment after December 31, 1997. This credit phases out for joint filers if their income is between $80,000 and $100,000 and for single filers with income between $40,000 and $50,000. The credit can be claimed only in two taxable years. However, those who have gone beyond two years of study may take the Lifetime Learning Credit, according to which 20 percent of the first $5,000 of tuition and fees through 2002 and of the first $10,000 thereafter may be claimed. This credit may be taken for net tuition (less grant aid and military educational benefits) paid for postsecondary education after June 30, 1998. The credit is available on a per-taxpayer (family) basis and is subject to the same phase-out levels described above. (See http://www.ed.gov/inits/hope.) Families may claim the HOPE Scholarship tax credit for some members and the Lifetime Learning Tax Credit for others.

These programs have some drawbacks from the perspective of income distribution, however. First, they provide no benefits for exceptionally financially needy students because only individuals or families with taxable income can take advantage of the program. Second, one can claim only tuition paid less any grants or other types of assistance received. Thus, depending upon EFC and COA, an individual may derive no benefit at all from these programs because it

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[16]The following sources of aid must be deducted from the tuition to obtain "net tuition": qualified scholarship excludable from gross income under section 117; educational assistance allowance under Chapter 30, 31, 32, 34, or 35 of Title 38, USC, or under Chapter 1606 of Title 10, USC (military educational benefits); payment (other than a gift, bequest, etc.) for educational expenses excludable from gross income. (Taxpayer Relief Act of 1997, http://www.ed.gov/inits/hope/taxact.html.)

would be displaced by other forms of federal financial aid. The program may displace some of the EFC for students with substantial EFC and COA, or it may displace some loan obligations for students whose financial aid packages include various types of loans. It is not yet clear to what extent financial aid offices will alter financial aid packages to account for this program. If financial aid offices attempt to correct for the tax credit in their aid packages, it may be that the gain from the tax credit will be lost elsewhere. Thus, it is not possible at this point to assess the impact of the program and determine who will be most affected by it.[17]

Variations in Aid. We next explore sources of variation in college COA. These variations should be seen in the light of variations in financial aid. Although it is beyond the scope of this chapter to detail the variations in all sources of aid (federal, state, institutional etc.), we provide a broad outline of the variations in aid. Table 3.7 presents the variation in federal, institutional, and state aid by institutional control and length of program. It details both the percentage of students who received each type of aid and the average award granted. Unfortunately this data source breaks out institutions by public, private not-for-profit, and private for-profit, so the designations of institutional control do not correspond to those used elsewhere in this chapter. Moreover, because the data source does not provide standard errors, we are not able to distinguish statistically significant differences. Nevertheless, these data do provide some sense of the general variability in financial aid sources.[18]

With respect to federal sources of aid, 24 percent of all students received federal grants. At public four-year schools, the average award was $1,747 compared with $2,032 at four-year private not-for-profit schools. Thirty-six percent of the students in public four-year programs received federal loans (average award of $4,111) compared with 45 percent in private, not-for-profit schools (average loan award

[17]For a detailed examination of who benefits from the HOPE Scholarship tax credit, see Cronin (1997).

[18]For further information about state aid, the reader should consult John B. Lee and Suzanne B. Clery, *State Aid For Undergraduates in Postsecondary Education* NCES 999186, 1999. For further information about institutional aid, consult Lee and Clery, 1997.

Table 3.7

Amount Received and Percentage of Students Receiving Aid by Type of Institution, AY 1995–1996

Institution Type	Federal Aid					Institutional Aid		State Aid	
	Any	Grants	Loans	Work-Study	PLUS	Any	Grants	Any	Grants
Public									
Less than two-year	$2,117	$1,432	$3,573	Very low	Very low	$870	$904	$2,184	$2,491
	(16%)	(14%)	(3%)	(0%)	(0%)	(6%)	(6%)	(11%)	(9%)
Two-year	$2,647	$1,472	$3,070	$1,408	$5,184	$564	$577	$808	$768
	(22%)	(17%)	(8%)	(1%)	(0%)	(8%)	(7%)	(6%)	(6%)
Four-year	$4,943	$1,747	$4,111	$1,343	$5,294	$2,163	$2,176	$1,685	$1,620
	(45%)	(24%)	(36%)	(4%)	(3%)	(16%)	(13%)	(14%)	(13%)
Private not-for-profit									
Less than four-year	$4,172	$1,639	$4,065	$1,066	$3,706	$1,514	$1,612	$2,490	$2,247
	(52%)	(32%)	(35.7%)	(2%)	(4%)	(21%)	(16%)	(15%)	(13%)
Four-year	$6,030	$2,032	$4,472	$1,288	$7,748	$5,140	$4,967	$2,079	$1,984
	(52%)	(24%)	(45%)	(15%)	(6%)	(43%)	(41%)	(22%)	(22%)
Private for-profit									
Less than two-year	$4,374	$1,555	$3,587	Very low	$4,299	$1,643	$800	$3,214	$2,800
	(70%)	(52%)	(52%)	(0%)	(5%)	(13%)	(6%)	(8%)	(5%)
Two-year	$4,946	$1,557	$4,268	Very low	$4,652	$1,429	$1,063	$2,178	$1,926
	(71%)	(46%)	(57%)	(1%)	(6%)	(6%)	(5%)	(14%)	(12%)

SOURCE: Adapted from Tables 3 and 4, U.S. Department of Education, NCES, *Ed Tabs*, NCES 97-570, 1997d.

NOTE: The category "Any" comprises grants, loans, work-study, and other sources of aid. Average amounts are calculated for those who received the specified aid type. Amounts in nominal dollars.

of $4,472). While average work-study awards were similar across the two types of institutions ($1,343 versus $1,288), the percentage of students receiving them seemed quite different (4 percent versus 15 percent). PLUS loan access also seemed to vary across the two types of schools: Although 3 percent of students at public four-year institutions received PLUS loans (average award of $5,294), 6 percent of students in private not-for-profit schools received PLUS loans (average award of $7,748).

There were also dramatic differences in access to federal aid between public two-year schools and private for-profit two-year schools. Whereas 22 percent of students in public two-year schools received aid (average award of $2,647), among private for-profit two-year schools, 71 percent received aid (average award of $4,946). For federal grants, the average awards received by students in these two types of institution were often comparable, but the percentage of students receiving such aid varied dramatically. For example, although 17 percent of students in public two-year schools received federal grants (average award of $1,473), 46 percent of students in private, for-profit, two-year schools received federal grants (average award of $1,557). With respect to federal loans, 8 percent of students in public two-year schools received such loans (average award of $3,070), compared to 57 percent of students in private for-profit two-year schools (average award of $4,269).

Institutional aid varied greatly across school type. Whereas 16 percent of students in public four-year schools received any aid (average award of $2,263), 43 percent of students in private not-for-profit four-year schools received any aid (average award of $5,140). Among public four-year schools, 13 percent received grants (average award of $2,176). Conversely, 41 percent of students in private not-for-profit schools received grant aid (average award of $4,967). Turning to two-year schools, 8 percent of students in two-year public schools received any aid (average award of $564) whereas 6 percent of students in two-year private for-profit schools received any aid (average award of $1,429). Among two-year private schools, 7 percent of students received grants (average award of $577); in private for-profit schools, 5 percent received grants (average award of $1,063).

State aid access also varied across institution types. Among four-year schools, 14 percent of students received any state aid (average award

of $1,685) compared with 22 percent of students in private for-profit schools (average award of $2,079). Thirteen percent of students in public four-year schools received state grant aid (average award of $1,620) compared with 22 percent of students in four-year private for-profit schools (average award of $1,984). As with other types of aid, variation was noted among two-year schools as well. Whereas 6 percent of students in public two-year programs received any state aid (average award of $808), 14 percent of students in private for-profit two-year schools received any aid (average award of $2,178). Similarly, 6 percent of students in public two-year schools received state grants (average award of $768) compared with 12 percent of students in private for-profit two-year schools (average award of $1,926).

Although some of this variation seems dramatic, one should keep in mind that these differences may not be statistically significant. In addition, need-based financial aid is driven in part by costs of attendance. Thus, some of this variation may be explained by differences in costs of attendance between public and private institutions. However, Table 3.7 does cast some light on the sources of variation of access to different types of financial aid across institution types. These findings should be kept in mind when we present materials on college costs in the next section.

Financial Aid: The Big Picture

So far, we have discussed several military educational programs as well as federal financial aid programs and their eligibility requirements. It is important to see how these various programs fit together and interact and to understand the types of commitments and procedures that inform colleges' admission policies and financial aid offices' "bundling" strategies. In this subsection we address these issues and attempt to draw a big picture of admissions, financial aid policies, and the interactions among various types of financial aid.

Because packaging approaches vary across schools, this discussion cannot provide information beyond the most general philosophies underpinning bundling or packaging strategies. To navigate through this complicated issue, we have relied upon Chapter 2 of the 1997–1998 *Student Financial Aid Handbook*, published by the Department of Education Office of Postsecondary Education (U.S. Department of

Education, 1997c). This handbook may be understood as a set of guidelines for financial aid professionals. The handbook describes "packaging" as the process of finding the best combination of aid to meet a student's financial need, given limited resources and given institutional constraints that vary from school to school. Even if a particular school does not participate in the campus-based programs discussed above, its students may still be eligible for some federal aid, such as a Pell Grant or the various loan programs. If a school does have access to other sources of aid, the financial aid administrator must decide the best way to allocate scarce funds depending upon the school's policies and the student's need. The handbook lists several questions that the administrator should consider when packaging aid:

- Should priority be given to students who apply first (a "first-come-first-served" philosophy)?
- Should grant aid be given to first-year students while loans and work-study should be given to students who have "had a chance to adapt to the academic program?"
- Given scarce resources, should the school's policy be to help the neediest or to provide an equal proportion of every student's need?
- Most provocatively, the handbook raises the issues of the makeup of the student body and the characteristics of the school's academic programs as affecting packaging procedures. However, the handbook does not expand upon these issues in any detail.

In a review of *The Student Aid Game* by Michael McPherson and Morton Shapiro, Donald Kennedy, president of Stanford University in the late 1980s, elaborates on two significant financial aid policies: need-blind admissions and building a class. He expresses concern that the policy of "need-blind" admissions—the practice of admitting students without considering financial need—is quickly becoming infeasible. Such policies, he states, are expensive and require the support of endowments that are shrinking in real terms at many institutions. What underlies the need-blind admission policies is the belief that diversity (in terms of socioeconomic status, race, talents, etc.) is an asset. Financial aid policies permit the cultivation and pro-

tection of this asset by allowing institutions to "compose, rather than merely admit, a first-year class."

Yet, as Kennedy explains, most colleges and universities are finding that need-blind policies are too costly at a time when the gap between the ability to pay and soaring tuition is widening and discretionary institutional resources are contracting. Driven by the bottom line to fill classrooms and dorms, financial aid may turn into "merit aid" to attract good students while denying aid to those applicants who seem most enthusiastic about an institution. Another emerging practice is "gapping"—whereby some students are offered less aid than the standardized federal means test suggests (Kennedy, 1998; Shenk, 1997). These insights into funds allocation have an important implication for this study, which we discuss next.

In Appendix E, we present examples of packaging approaches at two universities whose policies are available on the web. These policies are compared with a packaging strategy suggested by persons at the Department of Education, a useful exercise in several respects. First, as these examples demonstrate, the Pell Grant is the foundation upon which all other aid is layered. In fact, according to the Department of Education Federal Student Aid Information Center, this appears to be the case in general. Second, these policies demonstrate differing uses of the various types of aid. Third, as the variation in bundling strategy illuminates, a simple modeling of financial aid packages is impossible.

Impact of Veteran Status on Financial Aid Packaging. Having considered some of the broader motivations and structural possibilities for assembling aid packages, we need to understand how military aid benefits figure into these packages. As noted above, the variation across institutions in structuring financial aid packages poses significant difficulties in assessing the impact of veterans' benefits on financial-package composition. General models of aid packaging are not feasible given the different strategies of layering and funds distribution.[19] It appears that attempts to model financial aid packages

[19]The Program Analyst in the Forecasting and Policy Analysis Unit at the Department of Education explained that the extreme local variation in bundling strategies has made it difficult for the Department to create computer-based tools for students to predict their aid packages.

and the impact of veterans' benefits must necessarily be institution-specific. Despite the variation across states and institutions, however, some clear areas of impact may be noted.

First, veteran status confers on the student the status of independent student. This in turn affects the method of calculating the student's EFC and determining financial need and subsequent Pell Grant and other federal financial aid program eligibility. It is not entirely clear *how* eligibility will change: We cannot say that this status change renders a veteran more or less likely to qualify for particular aid programs. The issue is complicated by the fact that veteran eligibility is also affected by several other factors: e.g., the veteran's marital status, assets held and income earned during the year he or she applies for aid, whether the veteran has dependents, and so forth.

Second, although veterans' benefits are not included in the EFC calculation, they must be reported in the FAFSA. This accounting of veterans' educational benefits has several consequences. Because veterans' benefits do not affect EFC calculation or Pell eligibility, qualified veterans may receive the Pell Grant in addition to their veterans' benefits.[20] (The Pell Grants are never adjusted to take other types of aid into consideration (U.S. Department of Education, 1997c).) But these educational benefits are treated as resources that financial aid administrators must consider when determining eligibility for other federal financial aid programs and when bundling aid packages. Thus, it is likely that veterans' educational benefits will displace other forms of aid for which the veteran would have qualified in the absence of veterans' benefits.

On the one hand, it is possible that military educational benefits would simply displace other grants from the aid bundle (e.g., SEOG, SSIG, institutional grants) that veterans would have received had they not participated in the military. On the other hand, it is possible that the benefits would replace loans. The latter possibility is important given the shift in financial aid paradigms from grant-based programs to loan-based programs. Thus, one important question—which the available data cannot address—is whether veterans leave

[20]Although veterans' benefits are not to be considered in determining Pell eligibility, an article in the *Army Times* claimed that officials in Congress and the DoD maintain this is often done nonetheless (Daniel, 1998).

postsecondary education with less debt than do nonveterans. Work done by Klein et al. (1992) in assessing the impact of the Lilly Endowment Educational Awards (LEEA) suggests that the likely main effect of the LEEA program was a reduction in a students' loan burden, not an increase in participation rates or an expansion of options with respect to the schools students could attend.

The possibility that veterans' educational benefits displace other aid sources motivated the House of Representatives to introduce H.B. 6 (the House version of HEAR) in 1998. This bill proposed to exclude veterans' benefits from the determination of financial need. Note that the law stipulated that veterans' educational benefits must be counted as a resource when determining eligibility for campus-based programs and when determining financial need and eligibility for need-based Direct Loans or Federal Family Education Loans. This proposal would have precluded veterans' benefits from displacing other types of grant aid. The version of HEAR that was signed into law (Public Law 105-244) was much diminished relative to the House version. Effective October 1, 1998, active-duty MGIB benefits (benefits under Chapter 30 of Title 38) are no longer counted toward the determination of eligibility for subsidized Stafford Loans. It is not clear yet whether the MGIB portion of the CF is protected under this provision.

For all other programs (except the Pell), veterans' benefits continue to be included in the adjustment of financial need determination. Therefore, HEAR primarily impacts veterans' ability to expand their loan aid through subsidized Stafford Loans (Department of Education, Forecasting and Policy Analysis Unit, personal communication October, 1998).

Third, the structure of these educational benefits may create incentives that distort the ways that veterans select postsecondary education institutions. Because veterans' educational benefits are paid on a monthly basis regardless of the cost of attendance (monthly payments are greatest for full-time students), individual veterans may select a less expensive institution, allowing them to pocket the difference between the award and COA. This creates incentives for students to make decisions based on the cost of the schools rather than their quality. (It is not our intention here to imply any correlation between attendance costs and quality. We are merely suggesting that

cost and quality are two metrics that students use in making attendance choices.)

The work of Klein et al. (1992) suggests a fourth area of impact. Investigating the effects of LEEA in Indiana, they found that, as a result of equity packaging,[21] all recipients of financial aid benefited from the LEEA programs—not only the students who were awarded LEEAs. This benefit to all financial aid recipients arose principally because the program increased the total amount of funds distributed to gift-aid recipients. Klein et al. make several inferences based on the program and college financial policies. All things being equal, a school may prefer in-state students with financial need because they bring with them state and possibly LEEA dollars, whereas needy out-of-state students with need will not bring in such funds. Thus, colleges use less of their own discretionary funds to assist needy in-state students and are more generous with these funds to out-of-state students. Consequently, state and LEEA gift aid permits colleges to attract qualified out-of-state students who are financially needy. These funds also permit the colleges to attract desirable students who do not quality for Pell, state, or LEEA grants.

Klein and his colleagues suggest a further avenue of speculation. In light of the operation of financial aid programs, military education programs may have benefits that extend beyond financing and beyond the recipients of military educational benefits. Often cited are concerns about the continuation/disappearance of need-blind admissions policies ("Questions to Ask the Financial Aid Officer," 1997; Reich, 1998; Kennedy, 1998). "Questions to Ask the Financial Aid Officer" recommends that "if you are on the borderline as far as needing financial assistance is concerned, it may be in your best interest NOT to apply for financial aid when applying to a school that doesn't have need-blind admissions." If this concern is warranted, a veteran with these benefits may be a more attractive admissions candidate than an equally college-capable individual without these resources. Thus, veterans' benefits may have some marginal effect on one's chance of admission: All else being equal, a school may prefer a

[21]Equity packaging is an aid packaging policy that ensures that two needy students attending the same school with the same COA and EFC will receive the same amount of gift aid (Klein et al., 1992).

veteran with benefits to a financially needy student who lacks such resources.

ESTIMATING COLLEGE COSTS OF ATTENDANCE

Recently, some observers have questioned the adequacy of the purchasing power of military educational benefits, particularly the MGIB (Maze, 1998a; 1998b; 1999) and have offered suggestions aimed at expanding or altering the programs in a number of ways (*Report on The Congressional Commission on Servicemembers and Veterans Transition Assistance*, 1999). Such concerns bring to the fore the importance of contextualizing the purchasing power of these benefits over time with respect to the movement of college costs of attendance. In this section, we examine several aspects of postsecondary education costs to enable our analysis of two important programs, the active duty MGIB and CF, in the next section. Our analyses of the in-state tuition and fees data suggest that there are four types of variations that attract attention: variation across time, across the various states, across types of programs at institutions, and across types of institutional control (public versus private). To assess the degree to which military and civilian financial aid benefits have kept up with college costs of attendance over the past several years, we examine variation in COA across time. We present college COA trends since 1990. All averages for tuition and fees and other costs are enrollment weighted in this section unless otherwise stated.

We next examine the variation in educational costs of attendance across states and territories. Because costs of attendance vary widely across states, these state-level data may allow us to identify states that are less or more fully served by existing benefit programs. Identifying the cost characteristics of various states may also provide insight into better allocation of recruiting resources. State cost environments are also important because the Guard Bureaus offer benefits that vary on a state-by-state basis, and some states even offer specific programs for members of the reserve components of the military.

Finally, we analyze the variation across school types (public versus private) and whether the highest degree granted (HDG) is an AA or BA. Costs of attendance vary greatly across private and public institutions and across the various types of programs, characterized by

HDG. Looking at college costs of attendance according to the type of institutional control and degree program will cast light on which types of programs and institutions are most affordable under present financial aid programs.

Institutional Data Collection and Analysis

The data used in this analysis capture three main characteristics of postsecondary education institutions over the period AY 1990–1996: tuition and fees, room and board charges, and enrollment. The raw data contained 30,121 schools in the seven-year period, averaging 4,303 schools per year. However, we dropped schools for which there were no data on tuition and fees, enrollment, or numbers of BAs, AAs, or certificates awarded in any given year. Thus the final data set contained 19,912 institutions in all seven years, averaging 2,845 schools per year. Among the schools in the final sample, 49 percent were public (9,826) and 51 percent were private (10,086). As described in Appendix D, AY 1996–1997 data were used to project cost estimates out to AY 1997–1998.

We obtained institutional-level data on tuition and other costs of attendance, enrollment, and degrees granted from Web-based Computer Aided Science Policy Analysis and Research (WebCASPAR). The sources of the WebCASPAR data are the following:

- All cost of attendance data are taken from the Integrated Postsecondary Education Data System (IPEDS) Characteristics Survey (1969–1996).
- Enrollment data are taken from the IPEDS Fall Enrollment Survey (1967–1996).
- Earned degrees data are taken from the IPEDS Completions Survey (1966–1996).

The Integrated Postsecondary Education Data System (IPEDS) is conducted by the Department of Education's National Center for Education Statistics (NCES). Whereas the NCES universe contains all schools, the WebCASPAR universe contains only institutions accredited by an agency or association that is recognized by the Department of Education.

The following general information was drawn from WebCASPAR at the institutional level: institution's name, Federal Interagency Commission on Education (FICE) Code,[22] Carnegie Code,[23] State, Institutional control (public versus private), and HDG. (For further information about the data collection and analysis process, see Appendix D, Data Collection and Analysis.)

As discussed in the second section, the COA is an important determinant of a student's financial aid eligibility. We approximate the COA with the variable "total cost," which we created by adding tuition and fees, typical board charge (dormitory), and typical room charge (dormitory). Thus, "COA" refers to the Cost of Attendance as calculated by financial aid entities and "total costs" refers to our approximation of the COA. This total cost variable was created only for schools with non-zero data reported for all of the above variables and only for schools granting at least a BA. (Schools that grant an AA as their highest degree do not generally offer room and board to students.) Because we had extensive data only on dormitory costs, this variable reflects room and board charges on campus. (See Appendix D for further information about this variable.)

Variations Across Time

Tuition and fees have risen significantly at both public and private institutions over the past decade. The percentage increase observed in tuition across time varies greatly depending on the source of data and the subset of schools examined. Analysis of our data indicates that between AYs 1990 and 1996 the mean enrollment-weighted tuition and fees among all private institutions increased nearly 18 percent in real terms, whereas among all public institutions it

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[22]FICE codes are assigned only to accredited postsecondary education institutions. Across time, a school may have several FICE codes.

[23]Carnegie Codes date to 1970 and were developed by the Carnegie Foundation for the Advancement of Teaching. These codes have been included in IPEDS data to help users of the data identify institutions by type. The codes attempt to characterize the missions of the schools and are not meant to measure quality.

increased by 31 percent.[24] (All amounts have been normalized to 1998 dollars.)

Figure 3.1 presents the enrollment-weighted averages for in-state tuition and fees across the years AY 1990–1996 as well as our inflated estimates of AY 1997–1998 (in 1998 dollars), as described in Appendix D. As Figure 3.1 indicates, both private and public mean tuition and fees have large variance.

Figure 3.2 presents the growth in total costs of attendance for AYs 1990–1996 as well as our estimates for AY 1997 (in 1998 dollars). (Recall that total costs of attendance were estimated only for schools granting at least a BA.) Among private schools in our data, total costs of attendance between AY 1990 and 1996 grew at a real rate of 17 percent; for public schools the rate was 15 percent in real terms. The variance in the enrollment-weighted yearly averages for total costs of attendance is great for both types of 4-year institutions.

Variations Across States

Tremendous variation exists in costs of attendance across states and types of institutional control. Figures 3.3 and 3.4 illustrate the yearly tuition across states for both public and private institutions in AY 1996, the last year of data in our sample. For instance, in AY 1996 among all public institutions, California's enrollment-weighted mean tuition and fees were the lowest (slightly under $1,300) whereas Vermont's were the highest (slightly less than $6,000). Among private institutions in AY 1996, Puerto Rico had the lowest mean tuition and fees (nearly $3,200); Massachusetts's state average was the highest (nearly $18,000). (All dollar amounts are in 1998 dollars.) Because these data are state averages over all public and private schools, the differences across the states may result from different mixes of two- and four-year institutions in each state.

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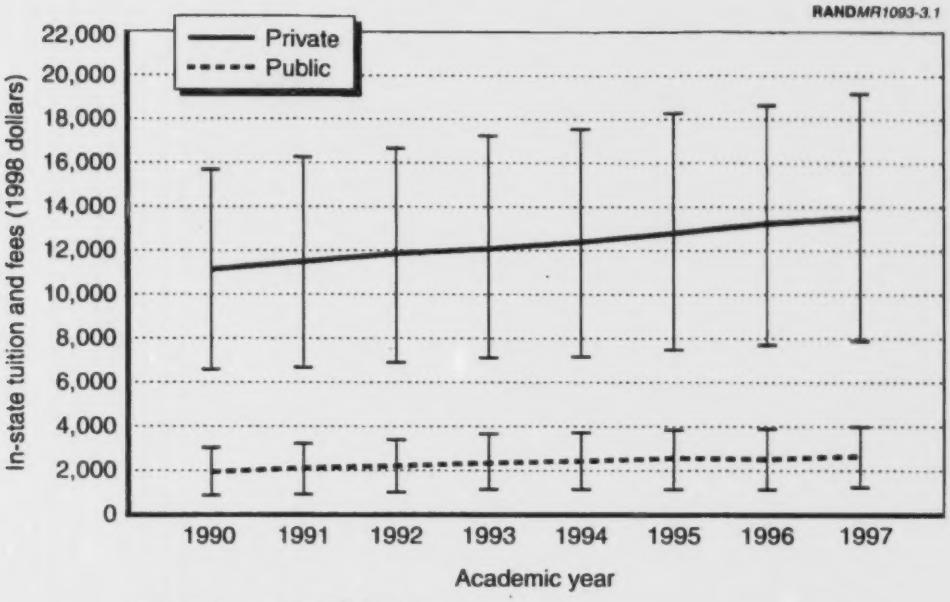
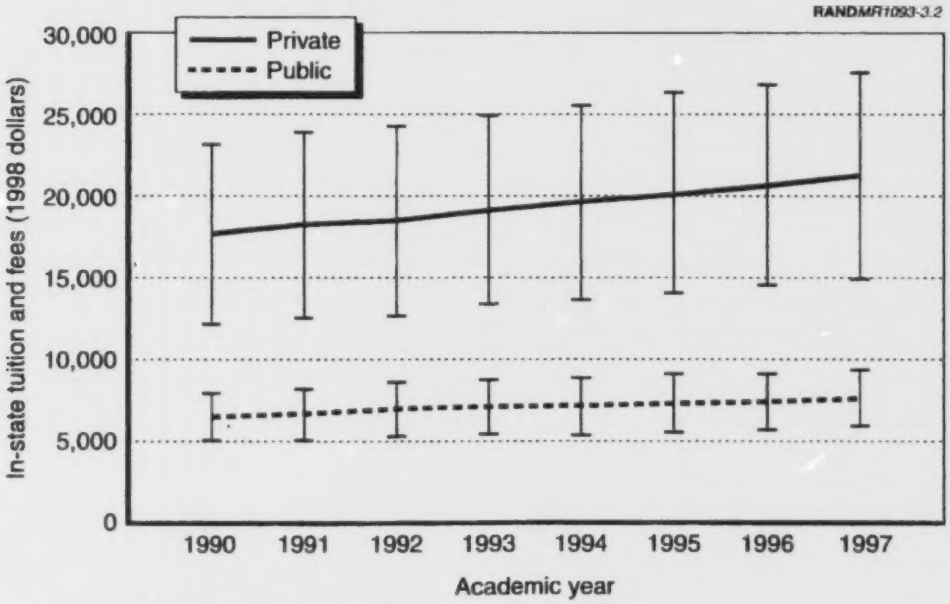
[24]Using NCES data reported in the *Statistical Abstract* for all institutions of higher education, we calculated a 21 percent increase in tuition for all private schools and an increase of 34 percent for all public schools over the same period.



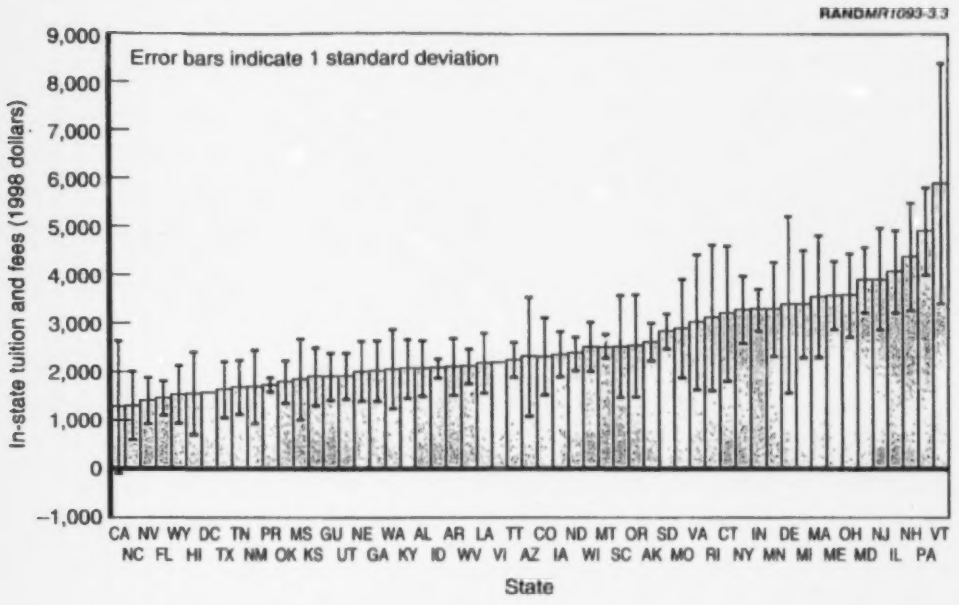
SOURCE: WebCASPAR.

Figure 3.1—In-State Tuition and Fees, AY 1990–1991 to AY 1997–1998



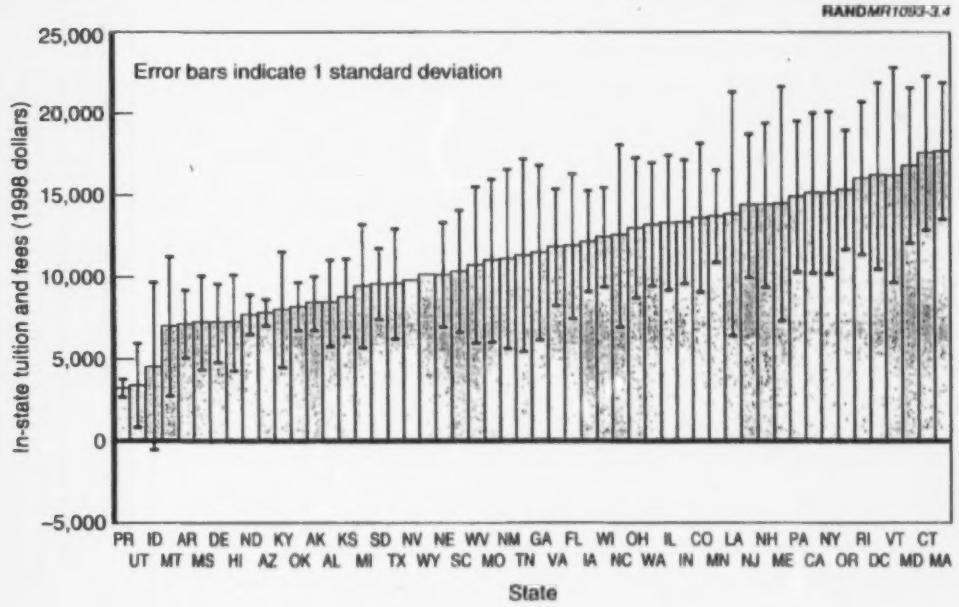
SOURCE: WebCASPAR.

Figure 3.2—Total Costs of Attendance: In-State Tuition and Fees, Dormitory Room and Board Charges, AY 1990–1991 to AY 1997–1998


RANDMR1093-3.3
Error bars indicate 1 standard deviation
In-state tuition and fees (1998 dollars)
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
-1,000
CA NV WY DC TN PR MS GU NE WA AL AR LA TT CO ND MT OR SD VA CT IN DE MA OH NJ NH VT
NC FL HI TX NM OK KS UT GA KY ID WV VI AZ IA WI SC AK MO RI NY MN MI ME MD IL PA
State

SOURCE: Analysis of WebCASPAR data.

Figure 3.3—AY 1996 In-State Tuition and Fees: All Public Institutions


RANDMR1093-3.4
Error bars indicate 1 standard deviation
In-state tuition and fees (1998 dollars)
25,000
20,000
15,000
10,000
5,000
0
-5,000
PR ID AR DE ND KY AK KS SD NV NE WV NM GA FL WI OH IL CO LA NH PA NY RI VT CT
UT MT MS HI AZ OK AL MI TX WY SC MO TN VA IA NC WA IN MN NJ ME CA OR DC MD MA
State

SOURCE: Analysis of WebCASPAR data.

Figure 3.4—AY 1996 In-State Tuition and Fees: All Private Institutions

Variation Across School Type

We observed significant differences in tuition across institutional control and whether the HDG was an AA or a BA. Table 3.8 provides enrollment-weighted average values of in-state tuition and fees for AY 1996, the last year of data in our sample. In AY 1996, among private two-year schools, average tuition was more than four times as high as among public two-year schools. Similarly, among BA-granting schools, the average tuition in private schools was more than four times higher as it was at public institutions.

Table 3.8

In-State Tuition and Fees for AY 1996

	All Schools with Tuition and Enrollment Data		
Institutional Control	Tuition and Fees	Standard Deviation	Number of Schools
AA-granting schools			
Private	$7,663	$3,152	255
Public	$1,770	$1,277	850
BA-granting schools			
Private	$13,464	$5,430	1168
Public	$ 3,077	$1,110	547

SOURCE: Analysis of WebCASPAR data.

NOTE: All amounts in 1998 dollars.

HOW DO AID PROGRAMS COMPARE WITH COLLEGE COSTS OF ATTENDANCE AND WITH EACH OTHER?

This section compares active-duty military educational benefits with college costs of attendance. First, we look broadly at the various civilian and military programs. Then we concentrate on the MGIB and CF programs and their purchasing power with respect to costs of attendance. We compare the MGIB and CF with college costs of attendance using two metrics. After describing these metrics, we evaluate the MGIB with respect to tuition and total costs of attendance using the first metric. We then compare the maximum CF benefit with tuition and total costs of attendance using the first metric. Finally, we analyze the MGIB and CF employing the second metric.

Comparisons Among Financial Aid Programs

To contextualize costs of attendance, this subsection draws comparisons across different financial aid programs offered by the military and by federal programs. First, we compare the maximums of several programs with estimated average public- and private-school tuition. Later, to contextualize growth in college tuition, we compare growth in tuition costs faced by students with growth in several civilian and military financial aid programs. Because the types of programs being compared are quite different, a discussion about these program data is in order.

Facile comparisons across programs and between programs and costs are difficult because the conditions and terms of participation and eligibility are generally very different. For example, although there are federal maximums for programs like SSIG and FSEOG, only the Pell has a federally guaranteed maximum. Moreover, the average award is very different from the program maximum. Further, while in some ways the MGIB and CF benefits most resemble grant aid because they do not have to be repaid, maximum awards for these service-related benefits are obtained only after fulfilling specific terms of military duty. Moreover, participants in the MGIB and CF programs must pay $1,200 to participate.

Thus, if we hope to assess the relative value of the MGIB (or other military benefits) and federal financial aid programs to the high school student evaluating his or her options, we should perform some type of cost-benefit calculation. Although such a calculation is beyond the scope of this chapter, below we discuss some important considerations in determining the relative value of these different options and the choices that they may imply.

The real value military benefits relative to civilian benefits must reflect many other aspects associated with military service as well as consequences of the decision to pursue postsecondary education after high school or after completing military service. To illustrate the complexity of these tradeoffs, let us assume a ten-year period after high school for two students. One goes straight to college and the second youth goes to the military, fulfills a three-year term in the military, and then goes to college. Both attain BAs.

The youth who goes to college after high school immediately forgoes four years of labor force opportunity. Upon applying for financial aid as a dependent student, she may receive some or no financial aid and may even take out considerable loans to finance her education. She may work during the school year and during the summers. Upon finishing her BA, she enters the labor market and receives the college premium for the remaining six years in our assumed period.

The youth who enlists with the active-duty military receives active-duty wages, labor-market experience, tuition assistance while on active duty, and possibly tuition credit for experience garnered during service when she does go to college. She applies for financial aid as an independent student before her term ends and may receive grant aid or loan aid. Upon completion of her term and assuming she satisfied MGIB criteria, she enters college with the MGIB and possibly other forms of financial aid. Although she may work part-time during the school year and summers, she too generally forgoes time in the labor force to attain her BA. She enters the labor market with her BA, receives the college premium and likely will receive a further premium owing to her military-based job experience. She then works for the three remaining years in this assumed period.

In analyzing these two paths, we see that the high school student who goes straight into postsecondary education has lower opportunity costs to attending postsecondary education than does the veteran, because the veteran generally will receive a higher wage in the labor market when she completes her term. At the end of our assumed ten-year period, the student who went straight to college has six continuous years of experience receiving the college premium in the labor force. The veteran has three years of enlisted military service and three post-baccalaureate years of work experience receiving both the college premium and probably a "military service premium" as well. However, it is not necessarily obvious how the earning potential of these two individuals would compare at the end of the ten-year period.

It is obvious from this description of the two possible paths that the determination of the real value of military education benefits is very complicated from the perspective of an individual considering enlisting for those benefits. Thus, we must take care when comparing civilian and military financial aid awards because of the different

nature of the programs and their associated costs and benefits, as well as the implications these decisions have upon future earnings.

Moreover, comparing these aid programs to costs of attendance may also be misleading in some key ways. As discussed above, institutional aid is the fastest growing source of aid and some have suggested that discretionary income generated through tuition increases is funneled into financial aid packages. Thus, it is not clear how many students actually pay the "ticket price" of college attendance.

Comparisons across program maximums, although problematic, do provide some sense of how these programs stack up to each other and to college costs of attendance. Figure 3.5 presents estimates for AY 1997–1998 public- and private-school tuition and fees, FY 1998 military benefits, several federal grant- and loan-based programs, and the Hope Scholarship Tax Credit. Although comparing program maximums is problematic for the reasons described above, it is clear that active military educational benefits far exceed both the Pell and FSEOG grant awards as well as the Hope Tax Credit maximum awards. The MGIB and CF benefits even exceed the average subsidized loan programs (Perkins and Stafford) and the average unsubsidized Stafford Loan. Only the CF exceeds the average PLUS loan. (However, recall that the PLUS loan is taken out by the parents.) This crude analysis stresses the differences in the magnitude of these programs and does not consider the interactions among them.

Table 3.9 compares growth in tuition with growth in several key programs. Generally we compared data between AY 1990 and AY 1998 for all programs except the unsubsidized Stafford Loan program, which only became available in 1992. Because this period extends beyond our data, we used data reported in the *Statistical Abstracts*. As noted in Table 3.9, the growth in tuition costs faced by students was 28 percent in all private schools and 40 percent in public schools between AY 1990 and AY 1998. Both the average and the maximum Pell award grew 5 percent between AY 1990 and AY 1998. However, the average and maximum FSEOG award contracted by 25 percent and 20 percent, respectively. While the average Federal Perkins Loan contracted by 6 percent and the average subsidized Stafford Loan grew over 5 percent during AY 1990 and AY 1998, the average unsubsidized Stafford Loan grew by 66 percent between AY

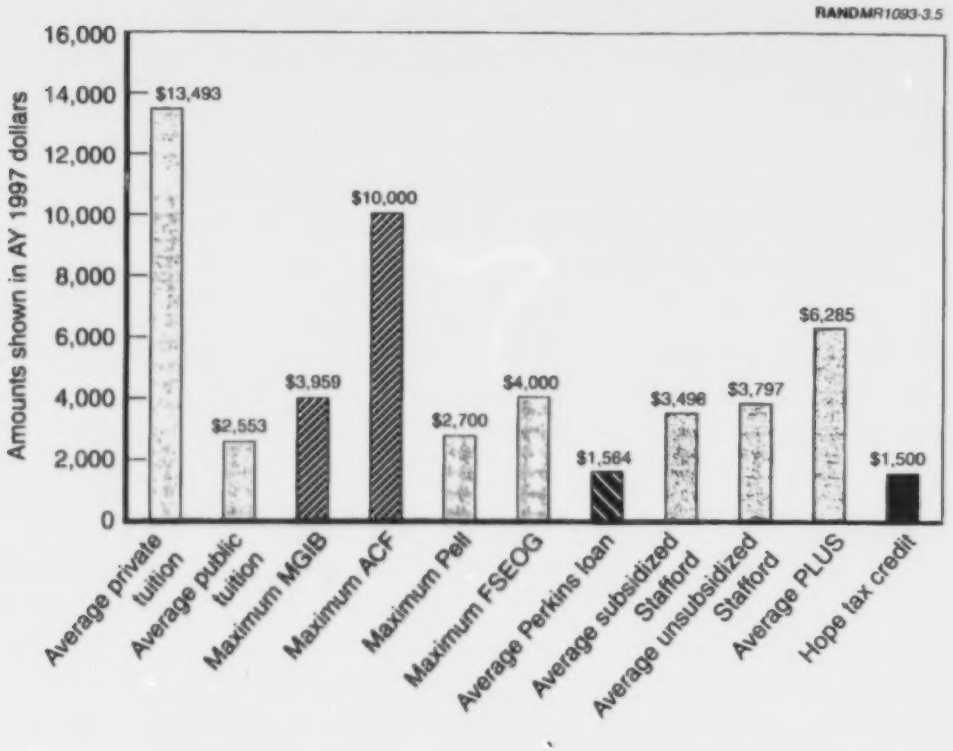


Figure 3.5—Comparison of Benefit Levels and In-State Tuition and Fees, AY 1997–1998 (FY 1998)

1992 (the start of the program) and AY 1998. The PLUS loan expanded by 64 percent in this period. Notably, the maximum MGIB award grew by 41 percent in this period and the CF award grew by 27 percent. Thus, the MGIB program kept pace with tuition growth for all public and private schools in this period. The CF program's growth was comparable to the growth observed in tuition charges across all private schools.

Therefore, both the MGIB and CF programs experienced growth in this period that was comparable to the average tuition among all private schools, while the MGIB even grew at a rate comparable to the higher growth rate observed for public schools. However, federal grant programs and subsidized loan programs (e.g., Perkins and subsidized Stafford Loans) lagged dramatically behind tuition

Table 3.9

Percentage Change Observed Between AY 1990 and AY 1998

Loan Type	Percent
All private	28
All public	40
Maximum MGIB award	41
Maximum Pell award	5
Average Pell award	5
Average FSEOG award	–25
Maximum FSEOG award	–20
Average Federal Perkins Loan	–6
Average subsidized Stafford Loan	5
Average unsubsidized Stafford Loan	66
Average PLUS loan	64

SOURCE: Tuition data and average federal financial aid data are from the *Statistical Abstracts of the United States, 1999*. Maximum Pell data were provided by the Department of Education, Forecasting and Policy Analysis, personal communication. MGIB data are from personal communication from the Department of Veterans' Affairs in August 1998 and March 2000. Army College fund data were obtained from U.S. Army (1989): *The 1989–90 Green Book* and from http://www-perscom.army.mil/Education/default.htm.

growth. On the other hand, growth in unsubsidized loans (PLUS and unsubsidized Stafford) far exceeded the average tuition growth for both public and private schools.

While it is a useful exercise to compare award magnitude and growth in these programs, one should keep in mind that all the programs may be considered components of a financial aid package that will be assembled along with other sources of aid in consideration of both the student's financial need and the philosophical and policy commitments of the relevant institution. Thus to ask how these programs compare is to address only one dimension. We must also understand how the programs interact and under what circumstances. To more fully understand the impact of military educational benefits, we need to understand how these benefits fit into an overall package of aid. Although we cannot address this concern with our present data, it is the subject of future inquiries.

Comparing Active-Duty Educational Benefits to College Costs of Attendance

We used two metrics to assess how military benefits compare with college costs of attendance. Using both metrics, we compared the maximum MGIB award and CF award with tuition and fees as well as with total costs of attendance.[25] In this analysis, we focused on AY 1997–1998 (FY 1998). We compared college costs of attendance for AY 1997–1998 with military benefits applicable during FY 1998. (In this section we use our estimates for AY 1997–1998.)

The first metric assesses purchasing power from the perspective of the student. It asks how many schools in a "state"[26] can be purchased by the maximum award for both the MGIB and CF in AY 1997–1998. (By "state" we mean the 50 states, the District of Columbia, Guam, the Virgin Islands, Puerto Rico, and the Trust Territories. Henceforth, we will simply use "state" to refer to all of these entities.) For this metric, we did not weight by enrollment. Instead, we divided in-state tuition and fees for each state into quartiles and indicated by horizontal lines on the graphs the FY 1998 values of the MGIB and CF. We performed analyses for both public and private schools and further distinguished schools on the basis of the highest degree granted (AA or BA). We performed the same analysis for total costs of attendance, which were estimated only for those schools with HDG of at least a BA.

The second metric is the ratio of the maximum benefit amount (MGIB or CF) and the cost variable under consideration—either enrollment-weighted tuition and fees or enrollment-weighted total costs of attendance. As with the first metric, we performed separate analyses for public and private schools and further distinguished schools by their HDG.

Although these metrics are similar, they shed light on the subject in different ways. The first metric permits an analysis from the student's

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[25]We did not perform this analysis with the uniform tuition assistance program because its maximum annual award of $3,500 (in 1998 dollars) is comparable to the maximum annual MGIB benefit of $3,959 (in 1998 dollars).

[26]Depending upon the school type (public/private and HDG), different states and school samples survive the exclusion criteria. This is true for both evaluation metrics.

vantage point: The student probably considers the price tag of the schools in her state. This metric assesses the proportion of schools in any given state that a student may attend using the MGIB or CF benefits.

With the second metric, we ask a different question of our data: What percentage of the enrollment-weighted state average of tuition or total costs of attendance may be purchased with these benefits? This approach is sensitive to schools whose costs of attendance are outliers in the distribution. (This effect may be somewhat mitigated by enrollment-weighting if these outlier schools have a small percentage of the state's overall enrollment.) The second metric does not provide a detailed picture of the student's opportunity in any given state, but it does provide general insight into which states are more affordable given the student's benefits.

MGIB Versus Quartiles of Tuition and Total Costs of Attendance: Metric 1. We first compare the MGIB benefits with estimated public two-year school tuition and fees. As depicted in Figure 3.6, MGIB benefits cover all or nearly all in-state tuition and fees among public AA-granting schools in all but seven of the 53 states in the sample. Nevertheless, MGIB benefits cover tuition and fees in 50 percent of the schools in two of those seven states and 75 percent of the schools in another three of those seven states. (Some states have few schools in the various categories. The number of schools for each state in each category is listed in Appendix C.) Figure 3.7 depicts the quartile breakdown of tuition and fees for private AA-granting schools compared with MGIB benefits. Among private AA-granting schools, MGIB benefits cover all tuition and fees for all schools in only three states. In ten states, MGIB benefits cover tuition and fees associated with the first quartile (25 percent of the schools in the given state). In six states, the benefits cover tuition and fees of the second quartile and in three states, they cover tuition and fees of the third quartile. Thus, MGIB benefits do not go far in purchasing private AA degrees but cover tuition costs faced by students in public AA-granting schools in the vast majority of states.

Figure 3.8 contains the quartile composition of estimated tuition and fees of public BA-granting schools for each state in AY 1997. As shown, MGIB covers all tuition and fees in 32 of the 54 states. Of the

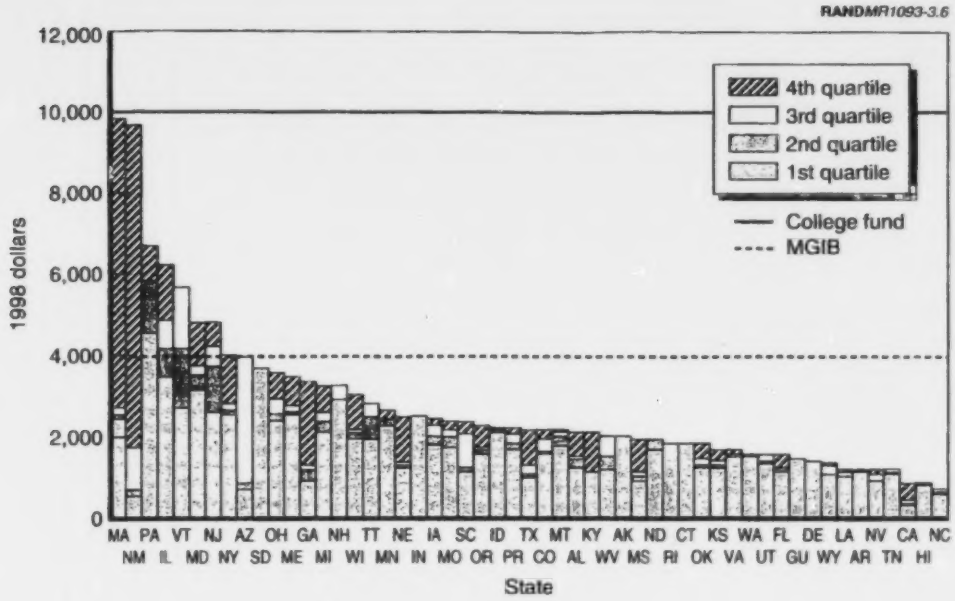
RANDMR1093-3.6
12,000
10,000
8,000
6,000
4,000
2,000
0
1998 dollars
4th quartile
3rd quartile
2nd quartile
1st quartile
College fund
MGIB
MA PA VT NJ AZ OH GA NH TT NE IA SC ID TX MT KY AK ND CT KS WA FL DE LA NV CA NC
NM IL MD NY SD ME MI WI MN IN MO OR PR CO AL WV MS RI OK VA UT GU WY AR TN HI
State

Figure 3.6—Tuition and Fees: Public Two-Year Schools, AY 1997

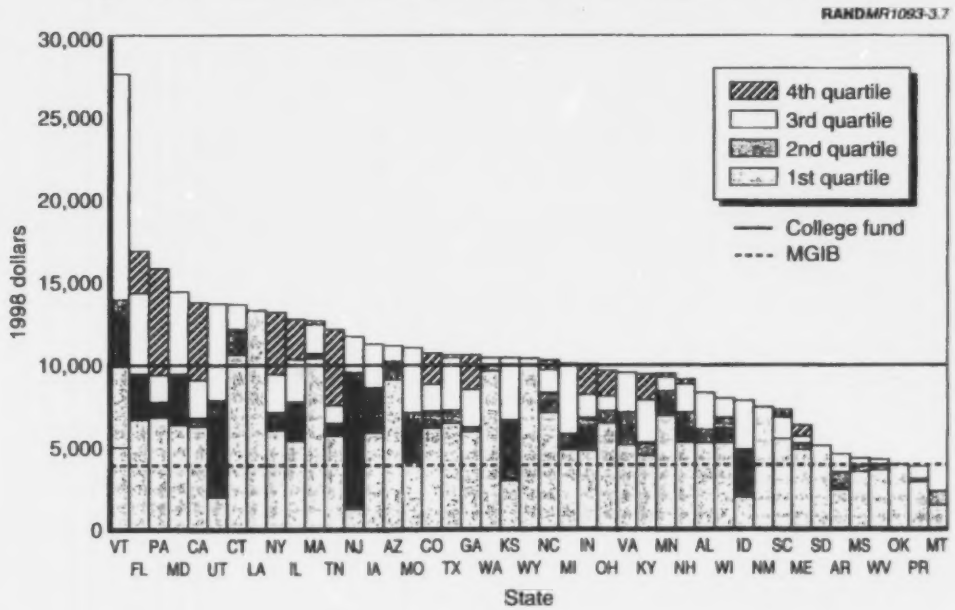

Figure 3.7—Tuition and Fees: Private Two-Year Schools, AY 1998

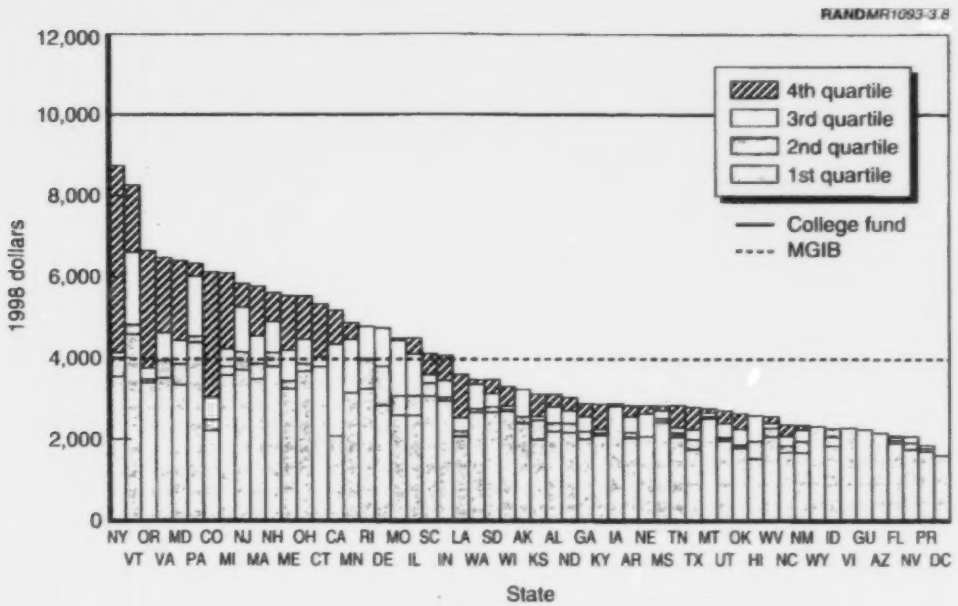
RANDMR1093-3.8
12,000
10,000
8,000
6,000
4,000
2,000
0
1998 dollars
4th quartile
3rd quartile
2nd quartile
1st quartile
College fund
MGIB
NY OR MD CO NJ NH OH CA RI MO SC LA SD AK AL GA IA NE TN MT OK WV NM ID GU FL PR
VT VA PA MI MA ME CT MN DE IL IN WA WI KS ND KY AR MS TX UT HI NC WY VI AZ NV DC
State

Figure 3.8—Tuition and Fees: Public Four-Year Schools, FY 1997

remaining 22 states, MGIB covers tuition and fees of three-quarters of the schools in four states and half the schools in 14 states. Figure 3.9 represents quartiles of tuition and fees estimated for private BA-granting schools for AY 1997. It shows that MGIB benefits do not cover tuition and fees of the fourth quartile in any state. Moreover, these benefits cover tuition and fees associated with the first quartile (one-fourth of the schools) in only five states and tuition and fees associated with the second quartile (50 percent of the schools) in only one state. Indeed, in most states, the MGIB benefits cover less than half of tuition and fees of those colleges in the first quartile. As with private two-year programs, the MGIB benefits cover a small fraction of the costs associated with tuition and fees in most private BA-granting schools in most states. However, MGIB benefits cover tuition and fees of BA-granting programs in most schools in most states.

Although MGIB benefits tend to cover most costs associated with public-school tuition and fees, they do not cover schools' total costs

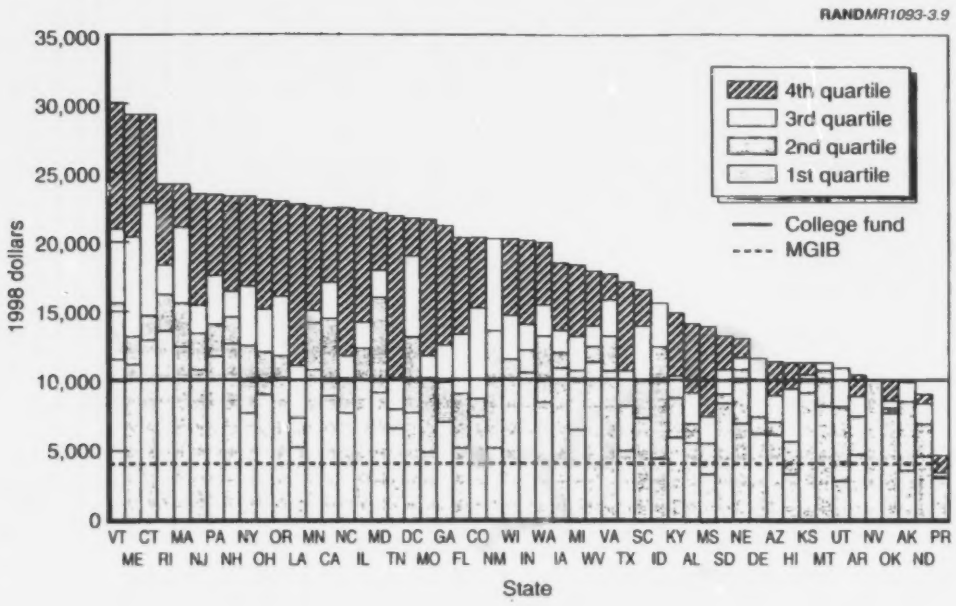

Figure 3.9—Tuition and Fees: Private Four-Year Schools, FY 1997

of attendance. Figure 3.9 depicts the quartile composition of our estimates of total costs of attendance for public and private BA-granting schools and the maximum MGIB benefit level. Even among public schools, the MGIB benefits do not cover total costs in all schools in any state. Indeed, among public schools in all states, MGIB benefits do not cover total costs associated with the first quartile of schools. Surely, MGIB benefits cover fewer total costs associated with attending private, BA-granting schools. MGIB benefits do not cover even half of the total costs associated with schools in the first quartile in most states.

Thus, the MGIB goes a long way in paying for college tuition at public schools in the majority of states. However, MGIB benefits do not go very far in purchasing tuition at private schools. When we evaluate the ability of MGIB to cover total costs of attendance incurred, we see that MGIB does not fare well among public schools and is even less helpful among private schools.

College Fund Versus Quartiles of Tuition and Total Costs of Attendance: Metric 1. When we turn to maximum college fund benefits, a very different picture emerges in terms of purchasing power. As depicted in Figure 3.6, among public AA-granting schools, CF benefits cover all in-state tuition and fees in all states. In fact, in most states, CF benefits greatly exceed in-state tuition and fees. (Refer to Appendix C for a breakdown of numbers of school by category in each state.) Among private AA-granting schools, CF benefits cover all tuition and fees for all schools in 18 of the 43 states in this sample (refer to Figure 3.7). In seven of the remaining 43 states, the benefits cover tuition and fees associated with schools in the third quartile. In 18 of those 43 states CF benefits cover tuition and fees associated with the second quartile. There are four states in which these benefits do not even meet the tuition and fees associated with schools in the first quartile. Thus, CF benefits are very generous for public AA-granting programs but far less so for private AA-granting programs.

CF benefits cover all tuition and fees in all public BA-granting schools in all of the 54 states (see Figure 3.8). As Figure 3.9 shows, CF benefits cover all (or nearly all) tuition and fees for all BA-granting private schools in only five states. For private BA-granting schools in most of the other states, CF benefits cover all tuition and fees of schools in the first quartile in 34 states and tuition and fees of schools in the second quartile in 19 states. In most states, the CF benefits cover less than half of tuition and fees of those colleges in the fourth quartile. As with private AA-granting programs, the MGIB benefits cover a small fraction of the costs associated with tuition and fees in most private BA-granting schools in most states while proving to be quite generous for most public BA-granting schools in most states.

Figures 3.10 and 3.11 depict total cost estimates for public and private BA-granting schools compared with CF benefits. As shown in Figure 3.10, CF benefits cover all total costs associated with BA-granting public schools in 33 of the 50 states. In the 17 remaining states, these benefits cover total costs associated with schools in the second quartile; in ten of those 17 states, the benefits cover total costs of schools in the third quartile.

Although CF benefits cover total costs of attendance for most public schools in most states, a very different story emerges when one looks

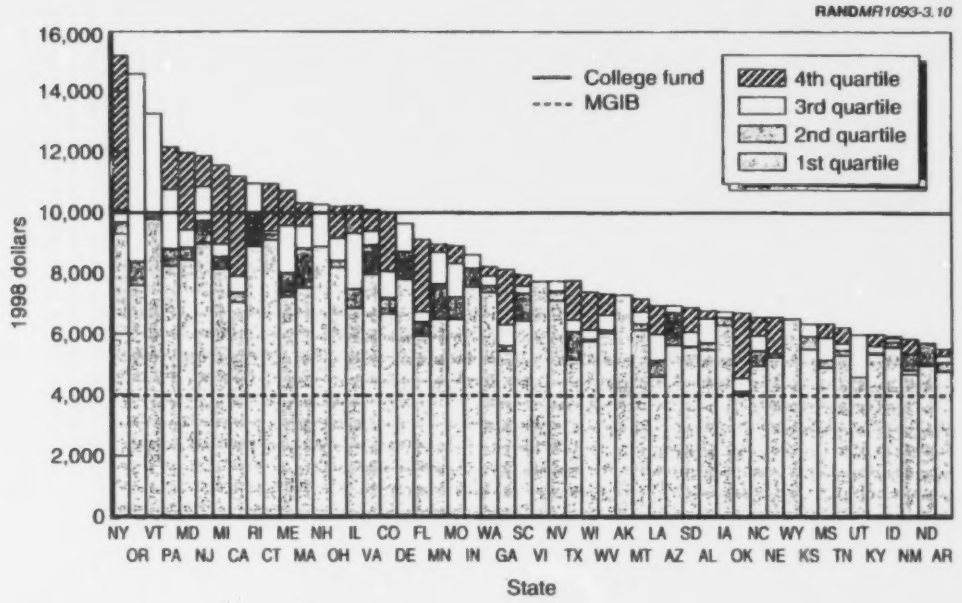

Figure 3.10—Total Costs: Public Four-Year Schools, AY 1997

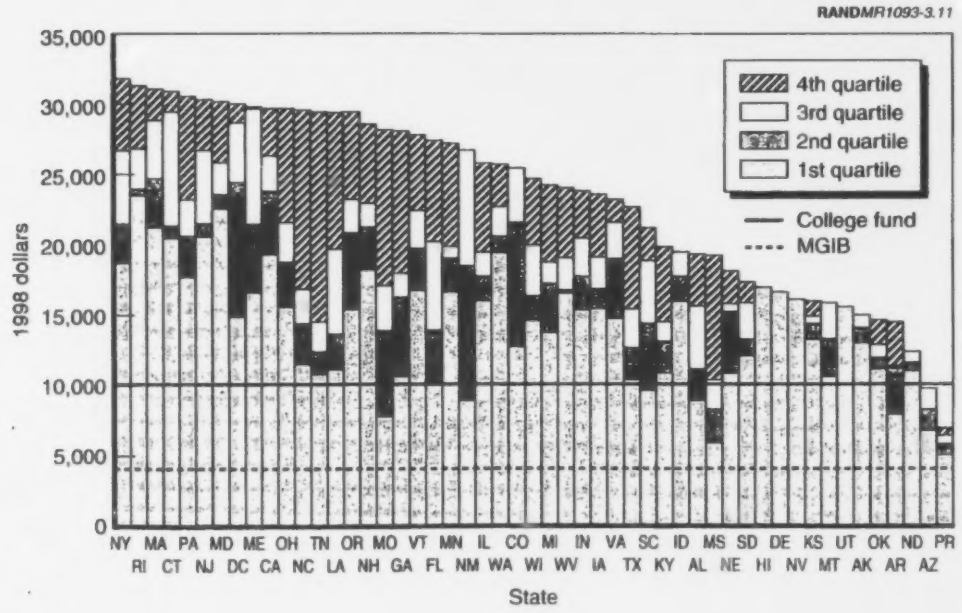

Figure 3.11—Total Costs: Private Four-Year Schools, AY 1997

at private schools. As Figure 3.11 illustrates, the CF benefits cover all total costs in all schools in only two states (Arizona and Puerto Rico). Indeed, the CF benefits do not even cover total costs for schools in the first quartile in most states.

Thus, CF benefits are generous compared with tuition among public AA-granting and BA-granting programs. CF benefits are also generous compared with total costs among private BA-granting programs. However, among private schools, the CF benefits do not provide complete coverage for tuition costs in either AA or BA-granting programs in most states and provide even less coverage for total costs of attending private BA-granting schools.

MGIB Versus Tuition and Fees and Total Costs of Attendance: Metric 2. The second metric we used for comparing the CF and MGIB benefits with tuition and total costs of attendance is the ratio of CF or MGIB benefits to the *enrollment-weighted* state averages for tuition and total costs of attendance for AY 1997–1998. When we evaluated tuition and fees, we stratified schools by public and private and by HDG: AA or BA. When we examined total costs of attendance, we stratified schools by public and private only, because we calculated total costs for BA-granting schools only (see Appendix D for our reasoning).

Figure 3.12 depicts the estimated percentage of enrollment-weighted state averages of in-state tuition and fees covered by maximum MGIB funds among public AA-granting schools. As shown, MGIB benefits either equal or exceed average in-state tuition and fees at public AA-granting schools in 51 of 53 states. Figure 3.13, which depicts the estimated coverage rate of the MGIB benefits among private AA-granting schools, shows that MGIB benefits equal state-average tuition and fees in only six of the 43 states. In most states, MGIB benefits cover considerably less than 75 percent of the state average.

Figure 3.14 depicts estimated MGIB coverage rates for state-averaged tuition and fees among public BA-granting schools. MGIB benefits meet or exceed the state-averaged in-state tuition and fees in all but 12 of the 54 states. In most of the 12 remaining states, the MGIB covers more than 75 percent of the average costs associated with tuition and fees. Figure 3.15 shows the MGIB coverage rates for state

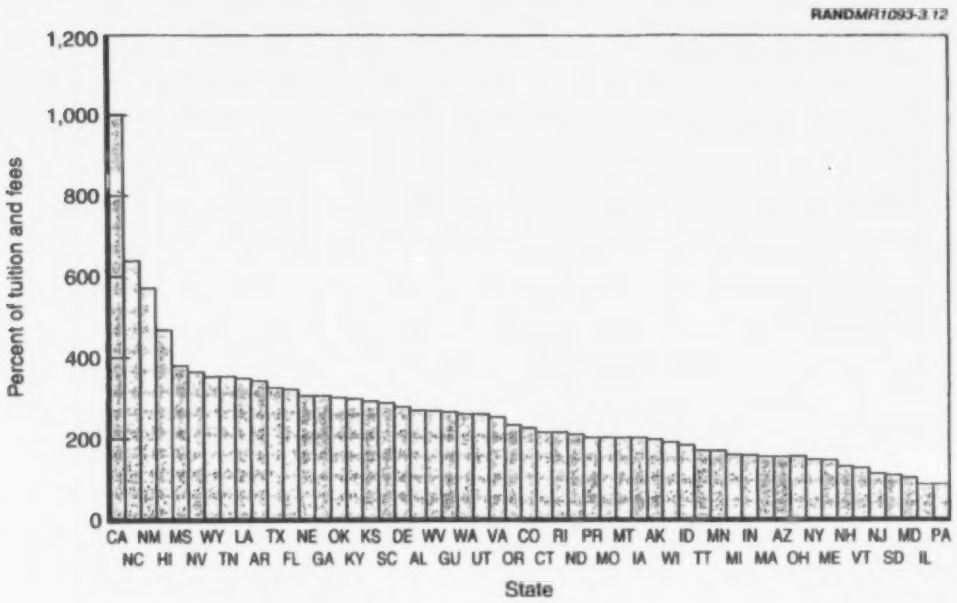
RANDMR1093-3.12
1,200
1,000
800
600
400
200
0
Percent of tuition and fees
CA NM MS WY LA TX NE OK KS DE WV WA VA CO RI PR MT AK ID MN IN AZ NY NH NJ MD PA
NC HI NV TN AR FL GA KY SC AL GU UT OR CT ND MO IA WI TT MI MA OH ME VT SD IL
State

Figure 3.12—Percentage of Average In-State Tuition and Fees at Public Two-Year Schools Covered by MGIB Benefits, AY 1997

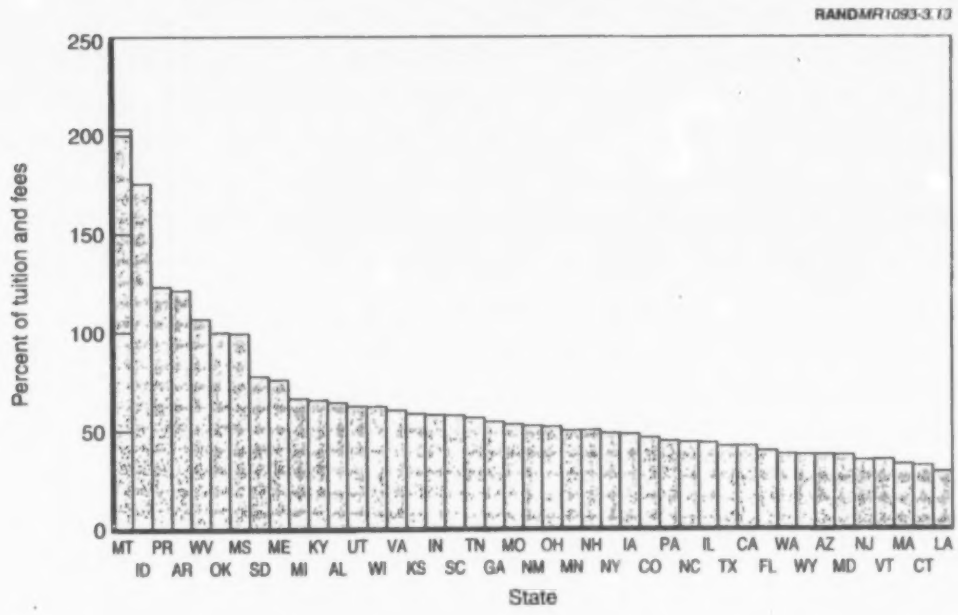
RANDMR1093-3.13
250
200
150
100
50
0
Percent of tuition and fees
MT PR WV MS ME KY UT VA IN TN MO OH NH IA PA IL CA WA AZ NJ MA LA
ID AR OK SD MI AL WI KS SC GA NM MN NY CO NC TX FL WY MD VT CT
State

Figure 3.13—Percentage of Average In-State Tuition and Fees at Private Two-Year Schools Covered by MGIB Benefits, AY 1997

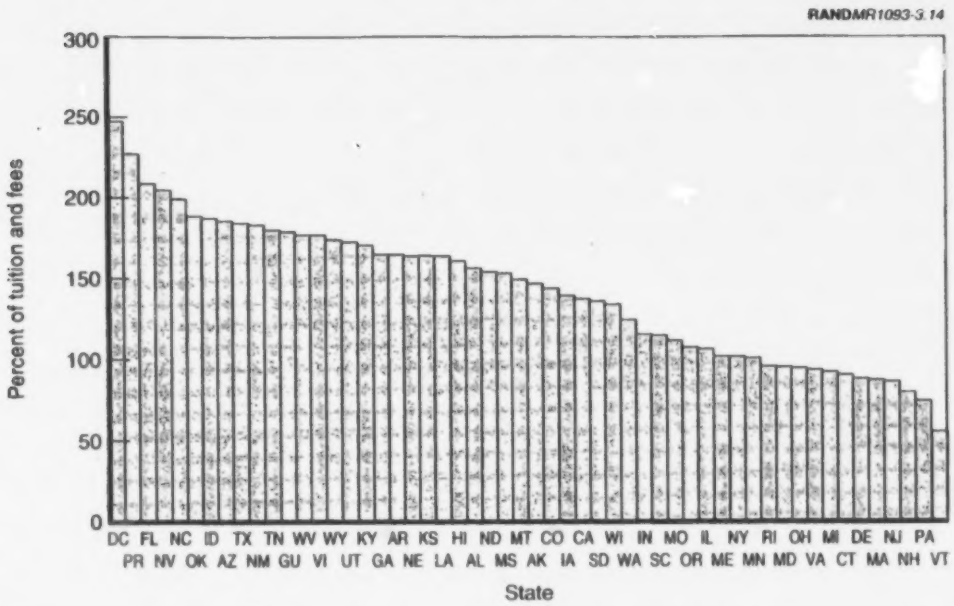
RANDMR1093-3.14
300
250
200
150
100
50
0
Percent of tuition and fees
DC FL NC ID TX TN WV WY KY AR KS HI ND MT CO CA WI IN MO IL NY RI OH MI DE NJ PA
PR NV OK AZ NM GU VI UT GA NE LA AL MS AK IA SD WA SC OR ME MN MD VA CT MA NH VT
State

Figure 3.14—Percentage of Average In-State Tuition and Fees at Public Four-Year Schools Covered by MGIB Benefits, AY 1997

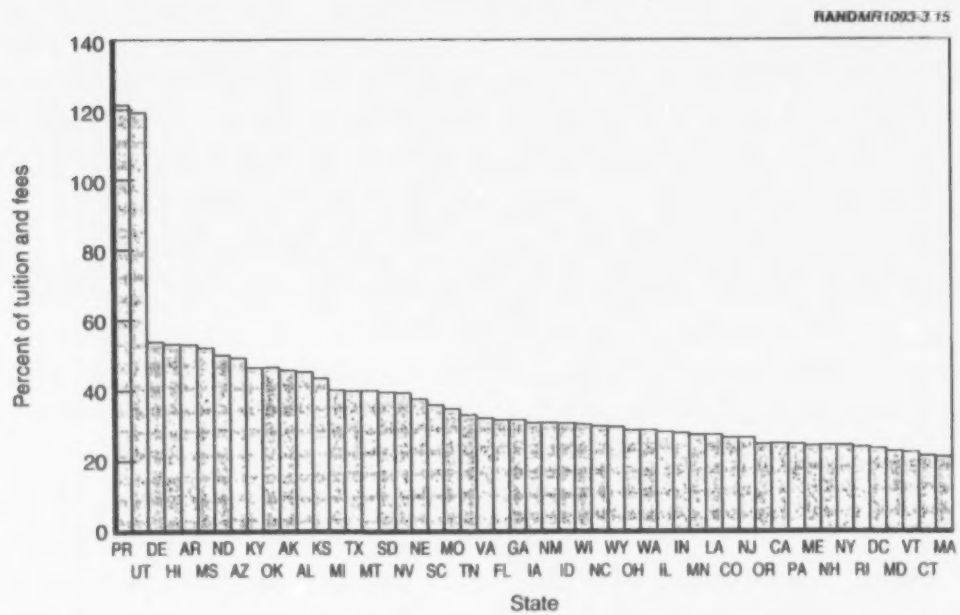
RANDMR1093-3.15
140
120
100
80
60
40
20
0
Percent of tuition and fees
PR DE AR ND KY AK KS TX SD NE MO VA GA NM WI WY WA IN LA NJ CA ME NY DC VT MA
UT HI MS AZ OK AL MI MT NV SC TN FL IA ID NC OH IL MN CO OR PA NH RI MD CT
State

Figure 3.15—Percentage of Average In-State Tuition and Fees at Private Four-Year Schools Covered by MGIB Benefits, AY 1997

averages of tuition and fees among private BA-granting schools. MGIB benefits cover far below 50 percent of the state average in most states. Indeed, MGIB funds meet the state average for private BA-granting programs in only two states: Puerto Rico and Utah.

Figure 3.16 and 3.17 present MGIB coverage rates for enrollment-weighted state averages of total costs among public and private BA-granting schools respectively. Even among public schools, MGIB funds do not equal the state-averaged total costs of attendance in any state. Indeed, in most states, MGIB benefits cover far less than 75 percent of state-averaged tuition and fees. Of course, among private schools, MGIB covers even less. As shown in Figure 3.17, the MGIB covers 25 percent or less of the state-averaged total costs of attendance in the vast majority of states (37 of 51).

Thus the MGIB is very generous in covering public two-year and four-year programs but not very generous with respect to purchasing tuition at private schools. However, even though the MGIB goes far in covering tuition among public schools, it does not go far in covering the total costs of attendance associated with attendance at a public BA-granting institution. It does even less well in covering total costs at private BA-granting schools.

College Fund Benefits Versus Tuition and Fees and Total Costs of Attendance: Metric 2. Figures 3.18 and 3.19 depict CF coverage rates for state-averaged tuition and fees among public and private AA-granting schools, respectively. As shown in Figure 3.18, CF benefits at least equal state average tuition and fees in all 53 states. In most states, CF benefits exceed average tuition by at least a factor of 3. Figure 3.19 shows that CF benefits equal or exceed average tuition and fees in 34 of 43 states. In the remaining states, CF benefits cover 75 percent of tuition and fees.

Figures 3.20 and 3.21 depict estimated CF coverage rate for state-averaged tuition among public and private BA-granting schools, respectively. As illustrated by Figure 3.20, maximum CF benefits equal or exceed average tuition and fees in all states—and in the vast majority of states the benefits exceed average tuition by at least a factor of 2. As shown in Figure 3.21, CF benefits equal or exceed the average tuition and fees in 17 of the 51 states in the sample. In the other

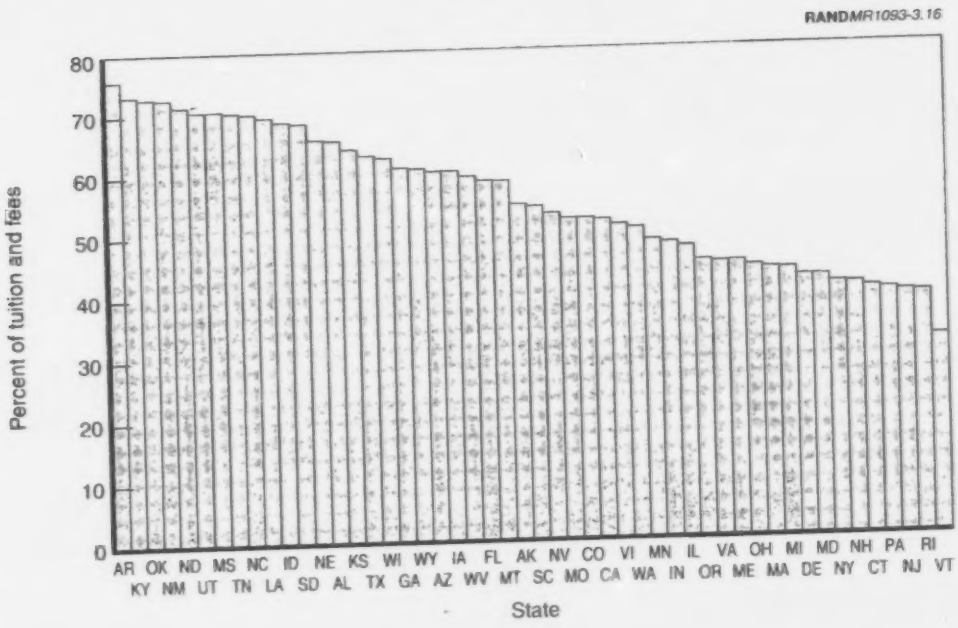
RANDMR1093-3.16
Percent of tuition and fees
80
70
60
50
40
30
20
10
0
AR OK ND MS NC ID NE KS WI WY IA FL AK NV CO VI MN IL VA OH MI MD NH PA RI
KY NM UT TN LA SD AL TX GA AZ WV MT SC MO CA WA IN OR ME MA DE NY CT NJ VT
State

Figure 3.16—Percentage of Average Total Costs at Public Four-Year Schools Covered by MGIB Benefits, AY 1997

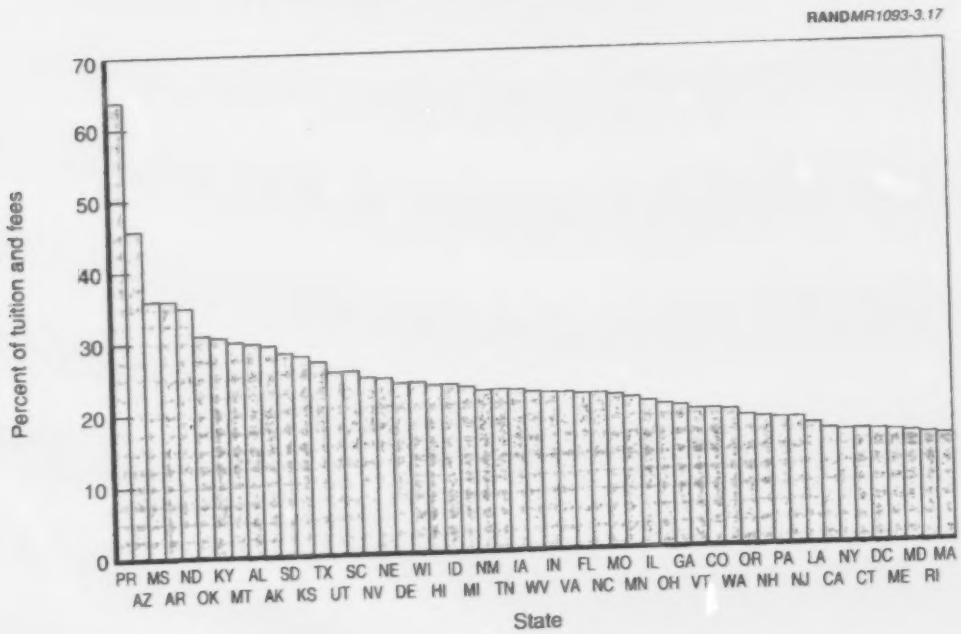
RANDMR1093-3.17
Percent of tuition and fees
70
60
50
40
30
20
10
0
PR MS ND KY AL SD TX SC NE WI ID NM IA IN FL MO IL GA CO OR PA LA NY DC MD MA
AZ AR OK MT AK KS UT NV DE HI MI TN WV VA NC MN OH VT WA NH NJ CA CT ME RI
State

Figure 3.17—Percentage of Average Total Costs at Private Four-Year Schools Covered by MGIB Benefits, FY 1997

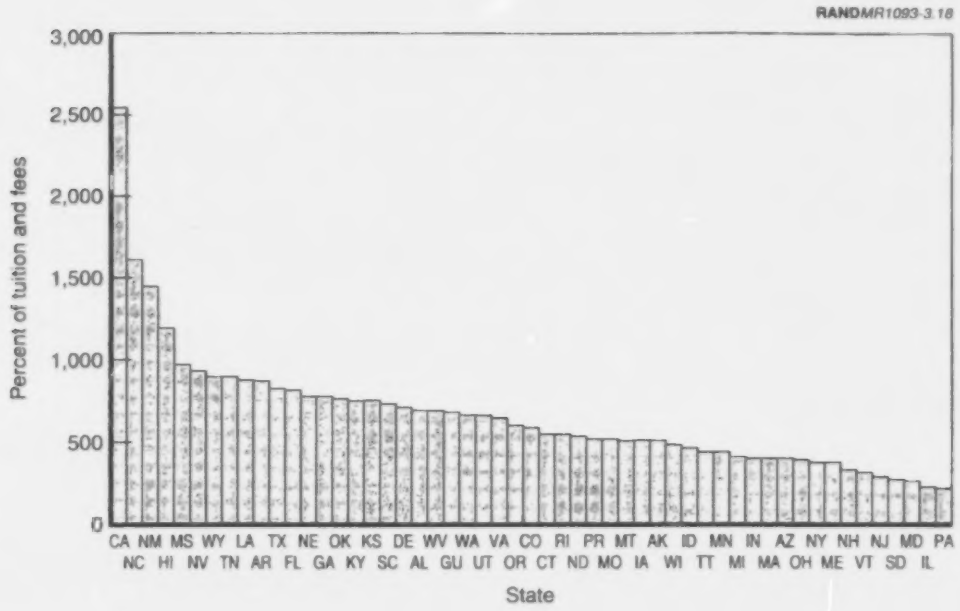
RANDMR1093-3.18
3,000
2,500
2,000
1,500
1,000
500
0
Percent of tuition and fees
CA NM MS WY LA TX NE OK KS DE WV WA VA CO RI PR MT AK ID MN IN AZ NY NH NJ MD PA
NC HI NV TN AR FL GA KY SC AL GU UT OR CT ND MO IA WI TT MI MA OH ME VT SD IL
State

Figure 3.18—Percentage of Average In-State Tuition and Fees at Public Two-Year Schools Covered by CF Benefits, AY 1997

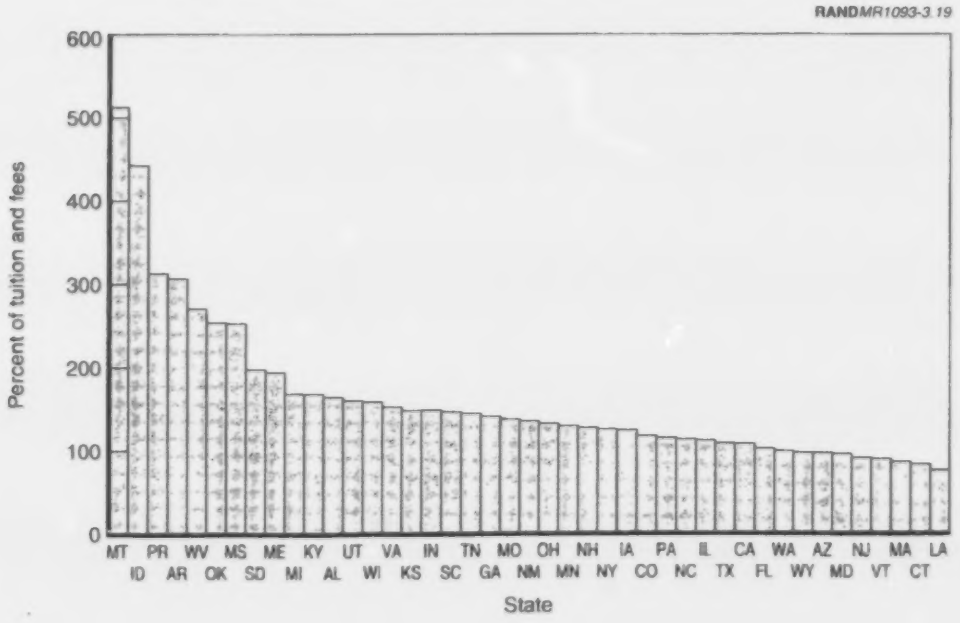
RANDMR1093-3.19
600
500
400
300
200
100
0
Percent of tuition and fees
MT PR WV MS ME KY UT VA IN TN MO OH NH IA PA IL CA WA AZ NJ MA LA
ID AR OK SD MI AL WI KS SC GA NM MN NY CO NC TX FL WY MD VT CT
State

Figure 3.19—Percentage of Average In-State Tuition and Fees at Private Two-Year Schools Covered by CF Benefits, AY 1997

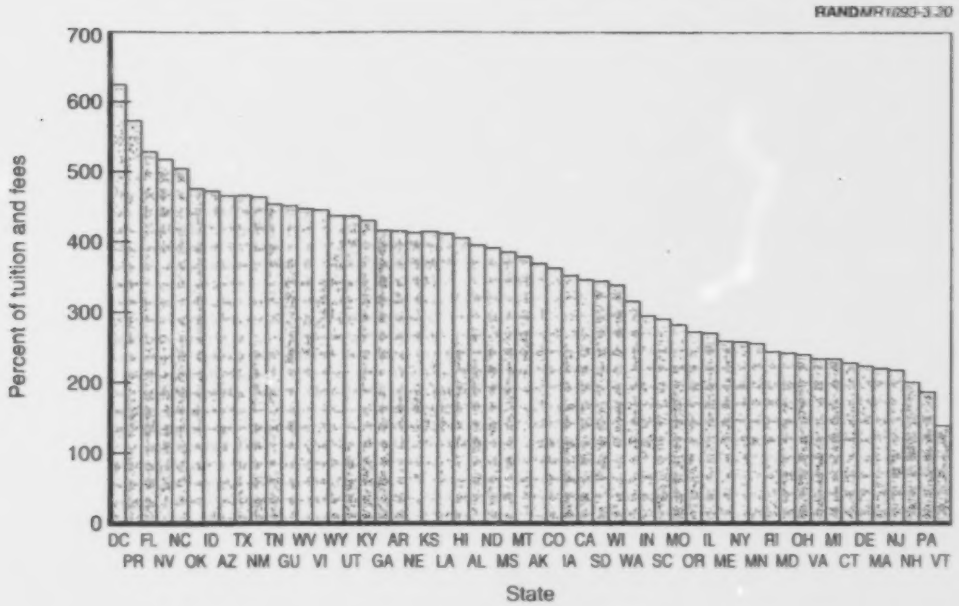
RAND MR1093-3.20
Percent of tuition and fees
700
600
500
400
300
200
100
0
DC FL NC ID TX TN WV WY KY AR KS HI ND MT CO CA WI IN MO IL NY RI OH MI DE NJ PA
PR NV OK AZ NM GU VI UT GA NE LA AL MS AK IA SD WA SC OR ME MN MD VA CT MA NH VT
State

Figure 3.20—Percentage of Average In-State Tuition and Fees at Public Four-Year Schools Covered by CF Benefits, AY 1997

34 states, CF benefits cover 50 percent or more of the state average tuition and fees faced by students in private BA-granting schools.

Figures 3.22 and 3.23 depict CF coverage rates of total costs of attendance among public and private BA-granting schools. The figures show that CF benefits fare very differently for public and private schools. Among public BA-granting schools (Figure 3.22), CF benefits nearly equal or exceed the enrollment-weighted average total costs of attendance in all but one of the 50 states represented in the sample. Moreover, these funds cover over 80 percent of the average total costs in that state. However, as depicted in Figure 3.23, CF benefits do not approach full coverage of total costs of attendance in most states. CF benefits cover estimated total costs of attending private BA-granting schools in only two states (Puerto Rico and Arizona). In the majority of the 25 states, CF benefits covered between 50 percent and 75 percent of total costs. In 18 of the states, those benefits covered less than 50 percent of the total costs and in six states they covered between 75 percent and 90 percent of the total costs.

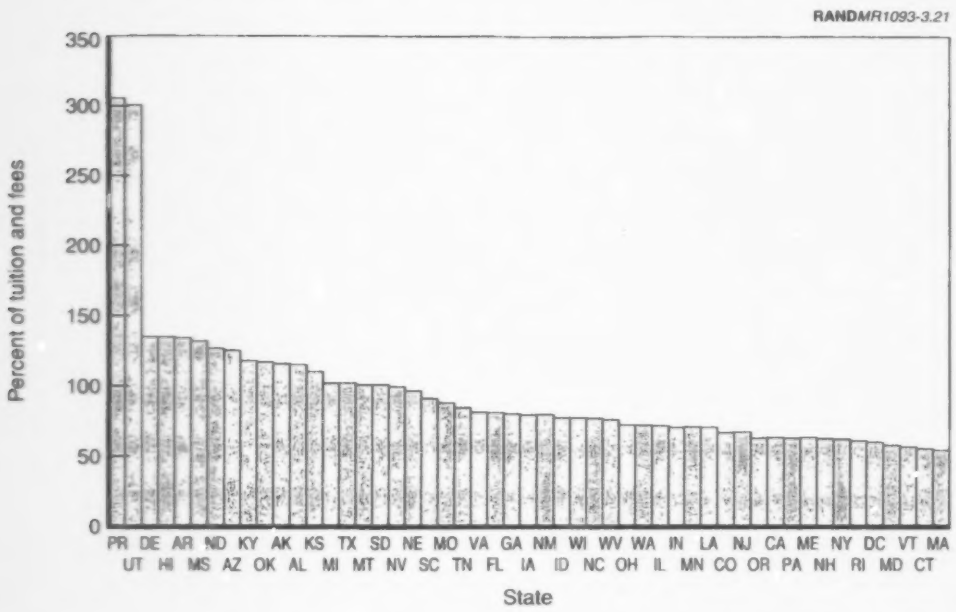
RANDMR1093-3.21
350
300
250
200
150
100
50
0
Percent of tuition and fees
PR DE AR ND KY AK KS TX SD NE MO VA GA NM WI WV WA IN LA NJ CA ME NY DC VT MA
UT HI MS AZ OK AL MI MT NV SC TN FL IA ID NC OH IL MN CO OR PA NH RI MD CT
State

Figure 3.21—Percentage of Average In-State Tuition and Fees at Private Four-Year Schools Covered by CF Benefits, AY 1997

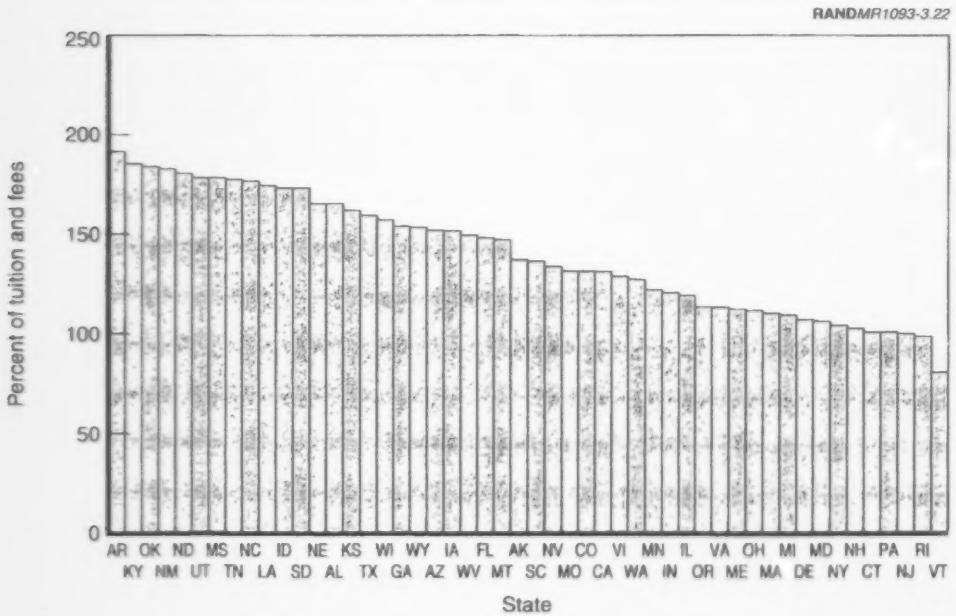
RANDMR1093-3.22
250
200
150
100
50
0
Percent of tuition and fees
AR OK ND MS NC ID NE KS WI WY IA FL AK NV CO VI MN IL VA OH MI MD NH PA RI
KY NM UT TN LA SD AL TX GA AZ WV MT SC MO CA WA IN OR ME MA DE NY CT NJ VT
State

Figure 3.22—Percentage of Average Total Costs at Public Four-Year Schools Covered by CF Benefits, AY 1997

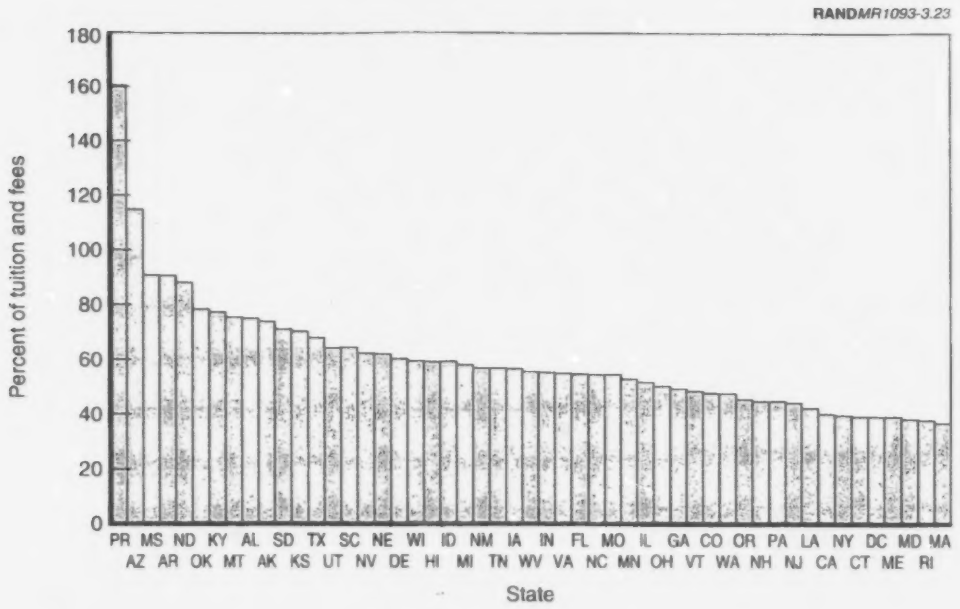
RANDMR1093-3.23
180
160
140
120
100
80
60
40
20
0
Percent of tuition and fees
PR MS ND KY AL SD TX SC NE WI ID NM IA IN FL MO IL GA CO OR PA LA NY DC MD MA
AZ AR OK MT AK KS UT NV DE HI MI TN WV VA NC MN OH VT WA NH NJ CA CT ME RI
State

Figure 3.23—Percentage of Average Total Costs at Private Four-Year Schools Covered by CF Benefits, AY 1997

Thus the CF goes quite far in meeting tuition and fees among public BA-granting and AA-granting schools and even in meeting total costs of attending public BA-granting schools. The CF does well with respect to private AA-granting schools but far less so with respect to private BA-granting schools. The CF fares even less well relative to total costs among private BA-granting schools.

Overall, the MGIB fares well in covering public tuition and fees but fares poorly in covering total costs of attendance, particularly among private BA-granting schools. The CF provides a dramatic increase in the ability to pay for college relative to the MGIB: In fact, the CF permits the purchasing of total costs of attendance at most public schools. However, even the CF does not cover 100 percent of expenses (either tuition or total costs of attendance) at private BA-granting schools.

CONCLUSIONS AND AREAS FOR FUTURE STUDY

Youth Have Different Options at Different Stages of Their Lives

Attracting high-quality youth into active duty enlistment involves challenges that vary with the youth's stage of life: whether they are still in high school and contemplating college, military service, or the labor market; whether they are in college and hoping to augment their financing options; or whether they have already completed or abandoned their planned program of undergraduate study.

A high-quality youth debating military participation or postsecondary education enrollment has numerous options. Civilian financial aid programs offer a variety of programs, each having its own qualifications. The active-duty and Reserve and Guard components also offer several ways to finance postsecondary education concomitant with fulfilling various commitments and requirements. Although military programs often offer maximum awards that are considerably larger than those of any single civilian program, these awards are based on fulfilling military service obligations. However, given the shift in financial aid from grant-based programs to loans, youth may decide that these military terms of service represent an attractive option compared with the accumulation of a large loan burden. Indeed, both the MGIB and CF are very lucrative particularly with respect to attending two-year public institutions. As Chapter Two of this volume suggests, this may be a market where the military has significant possibilities for recruitment.

At this point in the youth's decisionmaking process, active-duty participation is only one of several military service options. The Selected Reserves and National Guard offer attractive benefits that may not require the same commitments as full-time enlistment. These programs generally make public schools accessible and provide a part-time salary. Importantly, these programs permit youth to pursue their education while serving. Voicing the concern that the Guards pose significant challenges to the Active Army, the previously cited West Point study (1997, p. 19) argues that "The National Guard . . . gets the recruit who is college capable, while the active Army gets the recruit who is not college bound." Surely, full-time enlistment has advantages over the Reserve and Guards programs that we do not

explore here. Whether the packages available through Guards and Reserves programs are in fact better than those available through enlistment remains an empirical question.

To ensure that active-duty enlistment benefits are attractive options for this target population, we must track their purchasing power with respect to college costs of attendance. Reflecting upon our metrics for assessing the purchasing power of the MGIB and CF relative to tuition and fees and to total costs of attendance, we can draw several conclusions:

- The MGIB tends to cover tuition and fees at most public schools but is not very effective in covering private school tuition and fees.
- The MGIB does not go far in paying for total costs of attendance at public institutions and is much less helpful at private institutions.
- The maximum CF award is extremely generous with respect to public school tuition and fees and generally covers total costs of attendance as well.
- The maximum CF award also goes a long way in purchasing private-school tuition and fees but falls short of providing for private-school total costs of attendance.

Bundling Aid and the Impact of Veteran Benefits and Status

As suggested throughout this analysis, while comparing civilian and military program maximums is useful, we must try to understand how these programs interact and affect the final bundle of aid received by the veteran. Specifically, we need to know whether veterans' benefits are simply displacing other types of grant aid, particularly aid from institutional sources. This question is important: If one can obtain grant aid equivalent to the MGIB for college, then the lure of the MGIB as an enlistment incentive is diminished. However, it may be that veterans' benefits displace loan aid, not grant aid. Thus, we need to determine whether veterans have less debt than their nonveteran counterparts. It may be worthwhile, among other steps, to monitor the impact of the HEAR legislation on veteran debt.

Taking our cue from the work of Klein et al., we need to consider the possibility that military benefits may be a means by which various other sources of institutional funding can be released to support other students. Thus, military programs may cross-subsidize other students' costs of attendance. In a world where need-blind admissions policies are becoming less affordable, students with military educational benefits may be preferable to those without such resources. Institutions may have an incentive to admit veterans because they arrive with these educational benefits. Efforts to exclude veterans' educational benefits from consideration of other sources of financial aid should give us pause—especially if the present financial aid structure provides for an incentive to prefer veterans over nonveterans without such benefits.

Incentives Generated by Military Educational Benefits

Given what we understand about the mechanisms of financial aid, the incentive structure of military educational programs deserves attention. We have seen that among public schools these programs can be lucrative—especially the most current maximum college fund benefits offered through the Navy and Army. Consequently, a student may be motivated to attend the least-expensive school and pocket some of the excess funds. Moreover, while both the CF and MGIB pose incentives for high-quality youth to enlist, they also provide incentives for recruits to separate upon completion of their term because maximum benefits may be obtained only upon separation. Loan repayment programs may tend to attract individuals who did not obtain degrees and have large loan amounts rather than college graduates, who may prefer to join the officer ranks with higher pay rather than to enlist for the college loan repayment benefit.

Knowing whether grants or loans obtained in addition to veterans' education benefits are an incentive to choose higher-quality institutions may inform the ongoing debate surrounding the purchasing power of these benefits. If additional aid from civilian sources can provide this incentive, we require a better understanding of the impact of veteran status on need determination and of the impact of veterans' educational benefits on the overall aid package. For example, is there a substantive difference in the fraction of veterans qualifying for the Pell relative to nonveterans? Is there a difference in the

size of the award—and if so, why? Similar questions pertain to other federal financial aid grant and loan programs. This type of data may inform future modifications of military educational programs.

Another area for reflection centers on the expansion of the MGIB program in the past year and current congressional proposals for further expansion. One concern is whether expanding the MGIB would compromise the power of the CF to man hard-to-fill occupations. As the MGIB becomes more lucrative, it may affect recruiters' ability to draw marginal candidates into selective MOS with the CF benefit. Although FY 1999 MGIB awards are only half the maximum awards for the CF, it may be worthwhile to examine their impact—if any—on marginal CF enrollment.

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Chapter Four

THE ENLISTMENT POTENTIAL OF COLLEGE STUDENTS

Beth J. Asch and M. Rebecca Kilburn

INTRODUCTION

Recruiters traditionally attempt to meet their mission by targeting youth who plan to graduate from high school but have no immediate plans to attend college. As discussed in Chapter One, this group has not grown in the last two decades whereas the number of young people attending college right after high school has been rising steadily. This chapter explores whether college-bound youth are likely to be a promising pool of recruits and provides information to the services that will enable them to develop policies to tap this market. Given current recruiting shortfalls, now is an especially opportune time to identify new ways to expand the recruiting market.

The college market includes not only individuals who are attending college, but also seniors who plan to attend college in the future and former college students, such as dropouts and graduates. In addition, these different types of students may be tied to several types of post-secondary institutions including certificate or vocational programs, two-year colleges,[1] or four-year colleges. The research summarized in this chapter addresses the question of which of these segments of the college market might be the best to target for enlistment. We assess the enlistment potential of the various groups by examining

[1] We use the terms "two-year college" and "community college" interchangeably.

both the likelihood of their being eligible for military service and the likelihood that they will want to join the military. However, although high school students with plans to attend college are part of the college market, our analysis includes only those who have already started attending college.

This research also provides information about existing policies to attract the college market and what other policies might be effective. Policy effectiveness is likely to depend in part on which group is being targeted. A college dropout is likely to find a policy that pays students while they are in college unattractive, unless he or she plans to return to school. On the other hand, a dropout might be attracted by higher basic pay in the military for having some postsecondary education at entry. Not all programs will be attractive to every college group, and the design of future policies should consider which part of the college market is being targeted. In turn, which part of the market to target—dropouts, graduates, students, or entrants—depends on each group's enlistment potential.

Past studies of the enlistment potential of the college market (e.g., Shavelson et al., 1983) focused primarily on the likelihood that college students and college-bound high school students would be eligible to enlist. For example, Shavelson et al. (1983) examined the age, educational background, and aptitude of these groups. They also examined the programs implemented by the services in the early 1980s to attract college-bound youth and surveyed the obstacles to the programs' success. While such studies provide important insights into past programs, our work extends beyond them in two key ways.

First, we recognize that although many college-educated youth might be eligible to enlist, they are not equally likely to *want* to enlist in the military. Previous RAND research (Kilburn and Klerman, 1999; Hosek and Peterson, 1985, 1990) has shown that certain individual characteristics are associated with a higher probability of choosing to join the military instead of working or attending college immediately after high school.

Second, we explore whether enlistment potential is related to the stage of the individual's college career—that is, whether the student has just entered college, has dropped out, has graduated, or is still enrolled after the expected graduation date. If individuals sort them-

selves out over their college career on the basis of observed and unobserved characteristics, the characteristics of those who drop out will differ from those who graduate or who are still in school. Consequently, recruiters may find it more productive to direct their energies toward specific groups such as dropouts, rather than toward all entrants, if the groups' enlistment potentials differ. Therefore, we analyze the enlistment potential of individuals entering certificate programs, two-year colleges, and four-year colleges, as well as individuals who are in the following categories five years after entering two-year or four-year colleges: dropouts, graduates, and still enrolled.

Our analysis of enlistment potential uses a sample of young men aged 17–21 from the Beginning Postsecondary Students (BPS) data. These data followed first-time college students from their enrollment in 1989 until 1994. The data report demographic characteristics of the student, information about the student's institution and academic program, and the student's employment over the period.

This chapter is organized as follows. The second section reviews the individual choice model on which our estimation of enlistment potential is based. It also presents an overview of the empirical model we estimated to compare the enlistment potential of the different groups in the college market and describes the BPS data in this section. The third section reports the results of our enlistment potential estimates, and the fourth section presents our policy analysis. We conclude with a summary of our findings.

THE ENLISTMENT DECISION MODEL AND DATA

Our approach to evaluating enlistment potential is based on previous research on individual enlistment decisions (see Kilburn and Klerman, 1999; Kilburn, 1994; Hosek and Peterson, 1990). These studies determined which individuals are most likely to enlist by identifying the individual characteristics that are associated with enlistment. These characteristics include race and ethnicity, marital status, family background variables, and other factors. (In Chapter One, we discussed the utility framework that forms the foundation of individual enlistment decision models. For a thorough discussion of the individual enlistment decision model, see Kilburn and Klerman (1999).)

Kilburn and Klerman (1999) found that the characteristics that predicted enlistment for a sample of high school seniors in 1992 were largely unchanged from the characteristics that Hosek and Peterson (1985, 1990) found predicted enlistment of youths entering the military in 1980. In addition, using data from 1979 through the mid-1980s, Kilburn (1994) also obtained results that are largely consistent with those of this volume. Hence, we assume that a relatively stable set of characteristics predict individuals' probability of enlistment from the 1980s to the early 1990s.

Our basic methodology is to identify which segments of the college population exhibit the characteristics that were found in these earlier studies to be associated with enlistment. A fundamental assumption behind this approach is that similar factors predict enlistment for individuals in the samples used in the earlier studies—which did not include youths in college—and individuals who have some college experience. Kilburn and Klerman (1999) reported results for a sample of young people two years after high school graduation that included college attendees, enlistees, and those who primarily worked. We adopt the model specification used in that study because its sample is the most inclusive of all the individual-decision studies. Hence, its model results are most likely to be applicable to our study of a sample of college students.

The BPS is a National Center for Education Statistics (NCES) database. These data record information on a sample of first-time college students who began college in the 1989–1990 academic year. The BPS data set offers advantages over other data sets, such as the National Longitudinal Survey of Youth-1979 (NLSY-79) or National Education Longitudinal Survey (NELS), which report information on samples of college students. The BPS contains the most recent data that track respondents as long as five years after commencing post-secondary studies, and its variables are most similar to those used in earlier studies of individual enlistment decisions (such as Kilburn and Klerman, 1999). In addition, the BPS provides a more comprehensive portrait of the college population because it samples first-time beginning college students regardless of when they graduated from high school. This is in contrast to most surveys of students transitioning from high school, which are based on a cohort of graduating high school seniors. As a result, the BPS contains many more "nontraditional" college attendees who may have delayed college

entry—a steadily growing segment of the college population (U.S. Department of Education, 1996). The survey, which used computer-assisted telephone interviewing or CATI, collected follow-up information from original sample respondents in 1992 and 1994. In this study, we use only the initial survey and the 1994 follow-up.

Individuals included in the BPS were a subset of individuals who were interviewed initially as part of the 1990 National Postsecondary Student Aid Study (NPSAS:90), which surveyed first-time beginning postsecondary students.[2] The sample for NPSAS was selected using a multistage probability sample of students enrolled in postsecondary institutions between July 1, 1989 and June 30, 1990. In the first stage, 121 primary sampling units (PSUs), which are broad geographic areas, were identified. In the second stage, 1,130 institutions in the PSUs were identified that were eligible and would participate. In general, institutions were excluded if they (1) offered only vocational, recreational, or remedial courses, (2) provided only in-house training courses, (3) conducted only seminars that lasted less than three months, or (4) offered strictly correspondence courses. U.S. service academies were not considered eligible because of the unique nature of their mission and funding. In the third stage, more than 70,000 students enrolled at the institutions were selected. Of the original NPSAS sample, 11,700 students from 1,092 institutions were included in the 1990 BPS sample. Subsequent to the 1990 BPS interview, 3,773 respondents were identified as being ineligible, either because they were not enrolled for the first time in undergraduate programs but rather were in professional or graduate programs, or their original institution was ineligible, or for other reasons. We do not use data from the 1992 wave because it did not contain all the variables required for the analysis (which were included in the 1990 and 1994 waves) and because it had a relatively high nonresponse rate.

In this study, we include only respondents who were determined to be eligible for the 1994 sample. Of those deemed eligible for the 1994 survey, 92 percent were located, and 95 percent of those were interviewed. The 1994 BPS sample contained 7,914 qualifying respondents. The BPS sampling frame is described in detail in U.S. Depart-

[2]For complete information about the sampling frame of the NPSAS, consult Shepherd (1992).

ment of Education (1996), along with other information about the survey.

The BPS file includes sampling weights so that sample statistics will be representative of the national population of first-time postsecondary students who began college in the 1989–1990 academic year. Unless indicated, we weight all statistics in this chapter using the weights provided on the survey. Because all respondents in the BPS have already entered college, our analysis does not address the enlistment potential of high school students who plan to attend college in the future.

The BPS data report a wide array of information about the students, including demographic characteristics, family background, financial aid status, work history, and college career over the five years covered. The BPS data do not contain every variable included in Kilburn and Klerman's (1999) model of individual enlistment decisions. However, the data include variables that are similar or that can serve as proxies for most of the variables in enlistment decision models.

Two sets of characteristics are important for predicting whether an individual is likely to enlist. The first set includes characteristics that indicate whether the individual is likely to be eligible to enlist; we call these *eligibility characteristics*. They represent characteristics the military finds desirable in recruits, such as high aptitude scores, good health, and no criminal record. We list eligibility characteristics in the first column of Table 4.1. Although many of these eligibility standards can be waived, they nevertheless represent the most ideal characteristics from the perspective of the military.

The second column reports whether a direct measure of each characteristic was available in the BPS. For those variables that did not have a direct correspondence in the BPS, we included proxies when possible; these are listed in the third column of the table. Probably the most important characteristic for which we have no data is the AFQT score. Instead, we have individuals' self-reported cumulative grade point averages in the first year of college, whether they took remedial courses in the first year, and their self-reports about whether they think they have above-average abilities in academics in general, mathematics, writing, mechanics, and leadership skills. Also, the BPS data do not contain information about

specific disabilities of concern to the military, such as color-blindness and asthma. Instead, we use a variable that provides a self-assessment of overall health status and a variable indicating if the individual had any disabilities at entry. In addition, the BPS does not report individual course titles and whether individuals are learning skills of particular relevance to the military. To proxy military-relevant skill attainment, we include variables that indicate the individuals' major and whether their major is undecided. We use majors such as life sciences, physical sciences, computer science, and engineering to represent technical training. The characteristics listed in Table 4.1 were measured in academic year 1989–1990, with the exception of the variables related to health status. For health status, we used variables measured both in academic year 1989–1990 and in 1994, to account for the possibility that health status might have changed over that period for some individuals. We have specified all these variables, so that an increase in the value of a variable is associated with a greater likelihood of enlisting, as described in previous studies.

Table 4.1

Eligibility Characteristics

Characteristic	In data set?	Proxy
AFQT Category I-IIIA	No	Self reports on: Grade point average, Remedial course work, Academic ability, Mechanical ability, Leadership ability, Mathematical ability, Reading ability
High school diploma graduate	Yes	
U.S. citizen	Yes	
Healthy	No	Self-reported health status
No disabilities	Some	Any self-reported disability
No children	Yes	
No criminal record	No	None available
Technical skill training	No	College Major
Public service orientation	No	Performed community service

The second set of characteristics that predict whether an individual is likely to enlist are characteristics that have been found to be associated with the willingness to enlist. Although these characteristics predict enlistment, the military does not use them as eligibility criteria. For example, Kilburn and Klerman (1999) and Hosek and Peterson (1985) found that young people with less-educated mothers were more likely to enlist than young people whose mothers had more education. While mother's education is not a characteristic the military uses to determine eligibility, it predicts enlistment, presumably because it is related to an individual's willingness to enlist. We call these characteristics *decision characteristics*. Table 4.2 lists the vari-

Table 4.2

Decision Characteristics Associated with Being More Likely to Enlist

Characteristic[a]	Measure in BPS data
Not Hispanic	White, Black, or Other Race (Not Hispanic)
Mother's education high school or less	Mother's education <= high school diploma
Family income lower	SES <= 25th percentile
Not a full-time student	Not full-time student
Unemployed	Unemployed
Working and enrolled	Fraction of enrolled months employed
Hours worked higher	Hours worked while enrolled
Ever married	Married
Father's occupation not professional	Father's occupation not professional
Mother's occupation not professional	Mother's occupation not professional
Future occupational aspiration not professional	Future occupational aspiration not professional
Lower educational expectations	Does not expect BA or higher degree
Wants to get away from where grew up	Wants to get away
Income is not important	Says income is not important
Job security is important	Says job security is important
Lives close to home	Lives <50 miles from home

NOTE: SES = socioeconomic status.

[a]Source: Kilburn and Klerman (1999).

ables we use to represent decision characteristics and how we proxy the variable in our analysis in the cases where the variable was not found in the BPS data. All decision characteristics included in our analysis were measured in academic year 1989–1990.

The goal of our analysis is to describe the enlistment potential of various segments of the college population. Given the sampling scheme of the BPS data, we examine the enlistment potential of the following two sets:

1. Certificate program, two-year college, and four-year college entrants in the 1989–90 school year.
2. Two-year and four-year college students five years after entry: two-year dropouts, two-year graduates, and still enrolled in two-year college; four-year dropouts, four-year graduates, and still enrolled in four-year college.

Our analysis answers the following question: In which segment of the college market are recruiters most likely to find individuals who are eligible for and interested in military enlistment? To ascertain which group in each of the two sets above has the greatest enlistment potential, we identify which group is most likely to exhibit the desirable eligibility and decision characteristics, holding other characteristics constant at a set of assumed values. We accomplish this by estimating a multinomial logit model that indicates in which of the groups we are most likely to find individuals who have each of the characteristics, holding other characteristics constant. The analysis of students five years after college entry does not include those in certificate programs because the number of observations in each group—certificate dropouts, certificate graduates, and certificate students still enrolled—was too small.[3]

More formally, the model we estimate is given by the following equation:

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[3]We limit our analysis to males ages 17 to 21. Because certificate programs primarily enroll females and older students, the sample sizes are too small when we subdivide young male certificate enrollees into those who graduate, drop out, and are still enrolled after five years.

$$\Pr[Y_i = j] = \frac{e^{\beta'_j X_{ij}}}{\sum_j e^{\beta'_j X_{ij}}} \text{ with } j = [1, 2, \ldots, J].$$

The variable Y_i is a random variable indicating the group to which individual i belongs, and j indicates which of the J groups the observation is in. In the case of the regression of two-year, four-year, and certificate entrants, j indicates one of these groups. In the case of the regression of graduates, dropouts, and those still enrolled, j indicates one of these groups. The variable J denotes the total number of groups. In the first regression, J is 3; in the second, J is 6. The variable X_{ij} is a vector of characteristics, and β'_j is a vector of coefficients that will vary by group.

Each regression requires that we specify a baseline group. Each probability, and therefore, each regression coefficient, is measured relative to this group. For the regression describing the enlistment potential of entrants, the baseline group is the two-year group. For the regression describing the potential of graduates, dropouts, and those still enrolled, the two-year dropouts comprise the baseline group.

In addition to the variables listed in Tables 4.1 and 4.2, the vector X_{ij} includes factors other than characteristics that are related to military enlistment. These are included to control for some of the factors that are likely to be associated with the individual's decision to drop out or continue school. These characteristics include whether the person is financially dependent on his or her parents, the student's type of financial aid and amount, the cost of the student's institution, whether the student's institution is private or public, and whether the student attends a historically black college or university. The full set of variables included in the model is listed in Appendix G, Table G.1, along with the mean and standard deviation of each variable. The table includes three panels, one each for college entrants, two-year students five years after entry, and four-year students five years after entry. Except where the date is indicated in the variable list in tables in Appendix G, all of the other control variables are measured in academic year 1989–1990.

We specify the right-hand variables of the model so that an increase in the value is associated with a higher probability of enlisting, according to the literature. This implies that if the estimated coefficient of the variable in our model is positive for a particular group, we are more likely to find individuals with that characteristic in that group. For example, previous studies have found that Hispanics are less likely to enlist in the military than other racial and ethnic groups, holding all other characteristics constant. Rather than including a Hispanic variable in the model, we include the other racial and ethnic groups—White, Black, and Other Race—in the model, so that this finding is expressed in a way that includes the variables that have a *positive* impact on enlistment. Then we observe which college groups have a positive coefficient on these variables in the model to see which segments of the college market are most likely to contain those groups that comprise individuals likely to enlist. Ideally, to identify which segment of the college population has the greatest enlistment potential, we would like to predict the enlistment probability of each segment using coefficients estimated in previous studies (such as Kilburn and Klerman, 1999). This is not possible, however, because the BPS data do not contain some of the variables included in those earlier models and because the BPS includes only proxies for other variables in those models. For example, previous studies have included individuals' AFQT score as a predicator of enlistment (Hosek and Peterson, 1990; Kilburn and Klerman, 1999). AFQT is not reported in the BPS, so we include proxies for trainability—the concept the AFQT measures—such as grade point average, self-reported ability, and whether the person's college major is in a technical field.

To ascertain which group is the best recruiting target relative to the others, we identify the group most likely to have the variables associated with enlistment. It is also important to consider how much more likely it is to find a characteristic in one group versus another and how much a characteristic raises the probability of enlisting, holding the other characteristics constant at a set of values that produces the mean probability of being in the group. As discussed earlier, we do not know the latter precisely, but our estimation results indicate the former. Hence, in addition to examining the number of enlistment predictors that are more likely to be found in a group, we also estimate some simulations of the overall probability of finding

youths in a group with characteristics that are associated with enlistment. We discuss this further when we present the results.

Because our analysis seeks to estimate in which group the desirable characteristics are most likely to be found given the assumptions about the values of the other characteristics, we are more interested in the marginal effect of each characteristic on the probability of being in a given group rather than in the coefficient estimate per se. The marginal effect indicates the net change in the probability of being in one group given a one-unit change in a characteristic, holding the other characteristics constant at the values that produce the mean probability of being in a group. In contrast, the coefficient indicates the relative difference in the probability of being in one group *relative to the omitted baseline category* as a characteristic changes. We estimate the marginal effect of each variable for every observation in our sample and report the mean marginal effect (see Greene, 2000). We report the full set of coefficient estimates and their standard errors in Appendix G. Tables in the main text report the marginal effects and the significance of the variables' coefficient estimates.[4]

We limit our analysis to males aged 17–21 because this group is readily identifiable to recruiters and is the critical population from a recruiting standpoint. Only 2,242, or 38 percent, of the BPS entry cohort were young males in academic year 1989–1990. This percentage varies across institution type. Just 19.6 percent of those in certificate programs are young males. These institutions enroll a disproportionate number of females and older individuals. In contrast, about 45 percent of four-year entrants and over a third of two-year entrants are young males.[5]

Very few of the young male sample in the BPS were enrolled in certificate programs—only 4.3 percent. Therefore, institutions offering less than a two-year degree are not likely to have a large student

[4]Although it is theoretically possible to estimate standard errors of the marginal effects per se, these calculations are computationally extremely burdensome, and the significance level is generally the same as that of the coefficient estimates. Hence, we report the significance level as described by the coefficient standard errors.

[5]Since our analysis limits the data to those who enter college between the ages of 17 and 21, the ages of individuals in 1994—the last year in which individuals are observed in the BPS data—could be as high as 26.

population with a strong enlistment potential. The majority of young male college entrants are split between four-year and two-year institutions, with 50.7 percent enrolled in four-year colleges and 45.0 percent enrolled in two-year colleges. In contrast to the original intent of two-year colleges to be transition grounds to four-year institutions (Kane and Rouse, 1999), very few two-year entrants in our sample (14.0 percent) eventually transferred to four-year colleges. The numbers just presented suggest that, from a sheer volume perspective, recruiters may want to focus on two-year and four-year students when targeting the college market.

Next, we examine whether the characteristics of different types of college students provide additional information about where recruiters should concentrate their efforts.

EMPIRICAL RESULTS

The estimated multinomial logit equations indicate in which groups the military is mostly likely to find young men with a given characteristic, holding other characteristics constant at the values that produce the mean probability of being in each group. For each set of results, we first present our results pertaining to the eligibility characteristics and then present the results pertaining to the decision characteristics. The following tables show the marginal effects of the variables and indicate which variables had statistically significant coefficient estimates.

Table 4.3 compares certificate program, two-year college, and four-year college entrants with respect to their eligibility characteristics. The eligibility-related characteristics are listed on the left side of the table.

The columns represent the three types of entering institutions: two-year colleges, four-year colleges, and certificate programs. A positive marginal effect in a column means that the characteristic is more likely to be found in this group, holding constant the other characteristics and given the mean probability. For example, holding everything else constant at their assumed values, we find that those with a traditional high school diploma are more likely to be found among four-year entrants and certificate program entrants than are two-year entrants. A negative marginal effect means that the characteris-

tic is less likely to be found in that group, holding other characteristics constant at their assumed values. For instance, traditional high-school diploma graduates are less likely to be found among those entering two-year institutions, given the values of the other characteristics.

Table 4.3 shows that the four-year column exhibits the most significant positive marginal effects for entrants and that most of the negative marginal effects are in the two-year column. That is, recruiters are more likely to find young men with desirable eligibility characteristics among four-year entrants than in the other groups. For example, four-year entrants are more likely than two-year college and certificate entrants to rate themselves as above average in their writing and leadership abilities, and they are more likely to exhibit desired health and disability status. The large number of negative marginal effects in the two-year column indicates that recruiters are less likely to find individuals with these characteristics among two-year entrants than the other two groups.

Table 4.3

Marginal Effect of Eligibility Characteristics on the Probability of Being in Each Entry Group

Characteristic	Four-Year College	Two-Year College	Certificate
High school diploma	0.389***	–0.389***	0.000
Grade point average	0.027**	–0.027**	–0.000
No remedial math	–0.043	0.043	0.000
No remedial reading	0.145**	–0.145**	0.000
High mechanical ability	–0.02[illegible]	0.027***	0.000***
High writing ability	0.123***	–0.123***	–0.000
High leadership ability	0.114***	–0.114***	–0.000
U.S. citizen	–0.251	0.251	0.000
Healthy	0.065*	–0.065*	–0.000**
No disabilities	0.063	–0.065	0.000
No children	0.026	–0.026	–0.000
Community service	–0.030	0.030	–0.000

SOURCE: Results in Table G.2.

NOTE: 0.000 indicates marginal effects lower than 0.001. *Coefficient estimates are statistically significant at the 0.10 level; **statistically significant at the 0.05 level; ***statistically significant at the 0.01 level.

All of the marginal effect estimates for certificate entrants are extremely small—they are close to zero. This is because the certificate group is such a small fraction of our data. This small marginal effect indicates that having most of these characteristics does not substantially influence the probability of being observed in the certificate group.

The marginal effect estimates indicate in which of the three groups recruiters are more likely to find individuals having each characteristic, holding all others constant. But recruiters are really interested in identifying young men who are a "complete package"—who demonstrate many of the characteristics listed in Table 4.3 rather than just one. In addition, looking at each characteristic individually does not take into account the varying sizes of the estimates for the different variables. In order to assess which of the three entry groups would be most likely to contain individuals with all of these characteristics, we produced a simulation that indicates the mean probability of observing individuals with *all* the characteristics in Table 4.3. Specifically, we estimated a multinomial logit model, similar to the one described above, which contained only the eligibility characteristics. Then we estimated the probability that a person with all of those characteristics would be observed in each of the three entry groups. Not surprisingly, the simulation suggests that recruiters are most likely to find this type of student among four-year entrants and are least likely to find them among certificate entrants (Table 4.4). Details of this simulation are provided in Appendix G.

Next, we turn to the characteristics associated with the decision to enlist among entrants (Table 4.5). As in Table 4.3, we report marginal effect estimates and indicate which variables had significant coefficient estimates.

Table 4.4

Predicted Probability of Observing Student with All Desirable Eligibility Characteristics in Entry Groups

	Four-Year College	Two-Year College	Certificate
Probability	0.787	0.206	0.007

NOTE: See Appendix F for estimation details.

Table 4.5

Marginal Effect of Decision Characteristics on the Probability of Being in Each Entry Group

Characteristic	Four-Year College	Two-Year College	Certificate
White (non-Hispanic)	0.111	–0.111	–0.000
Black (non-Hispanic)	–0.118	0.119	–0.000
Other race (non-Hispanic)	0.352***	–0.352***	–0.000***
Mother's education less than high school	–0.078**	0.078**	0.000
Family SES <= 25th percentile	0.096	–0.096	–0.000
Not full-time student	–0.024	0.024	0.000
Unemployed	0.059	–0.059	–0.000
Hours worked in school	0.002**	–0.002**	–0.000
Never married	–0.075	0.075	–0.000
Working and enrolled	–0.254***	0.254***	–0.000
Father's occupation not professional	–0.087**	0.087**	–0.000
Mother's occupation not professional	–0.006	0.006	–0.000
Future occupational expectation not professional	–0.042	0.042	0.000
Doesn't expect more education	–0.316***	0.314***	0.002***
Wants to get away	–0.024	0.024	0.000
Income not important	0.031	–0.031	0.000
Job security important	–0.157***	0.157***	0.000
Lives close to home	–0.191***	0.191***	0.000

SOURCE: Results in Table G.2.

NOTE: 0.000 indicates marginal effects lower than 0.001. *Coefficient estimates are statistically significant at the 0.10 level; **statistically significant at the 0.05 level; ***statistically significant at the 0.01 level.

We observe that more decision characteristics are likely to be found among two-year college entrants. For example, the mothers of two-year entrants tend to have less education, other factors held constant at their assumed values. Since those whose mothers have less education are more likely to enlist, this characteristic implies that two-year entrants would be expected to be more likely to enlist, all else equal. However, we also find a number of variables that raise the odds of being in the four-year group, such as having a family in the lowest

socioeconomic statue (SES) quartile, being unemployed, and working more hours while in school. As in Table 4.3, the marginal effect estimates for the certificate entrants are all very small.

We estimate a simulation to assess the overall probability of finding youths with desirable decision characteristics in each of the entry groups. For this simulation, we include both the eligibility characteristics in Table 4.3 and most of the decision characteristics in Table 4.5. We do not include race and ethnicity because the services are unlikely to target particular racial and ethnic groups in their recruiting. The results of this simulation are shown in Table 4.6. It shows that on net we are more likely to find young men with desirable eligibility and decision characteristics in the two-year college and certificate program entry groups. Given the small size of the certificate entry population, however, it is likely to be more productive for recruiters to focus on the two-year college market because two-year college entrants exhibit characteristics associated with enlistment and are a much larger group.

We now turn to our analysis of the enlistment potential of respondents five years after entering college. First, we examine the eligibility characteristics of two-year and four-year college students by their status in 1994. We compare characteristics based on 1994 status because they may differ depending on whether the students dropped out, graduated, or were still enrolled five years later. That is, the 1989–1990 entrants may not be equally desirable from the military's point of view. By waiting for them to sort themselves into these groups, we may gain information that allows us to target the ones with the most eligibility characteristics. Furthermore, colleges and universities may be more amenable to the recruitment of those nearing graduation or those who are contemplating dropping out.

Table 4.6

Predicted Probability of Observing Student with Desirable Eligibility and Decision Characteristics in Entry Groups

	Four-Year College	Two-Year College	Certificate
Probability	0.040	0.493	0.467

NOTE: See Appendix F for estimation details.

Colleges might view the military as a competitor if the military targets the recruitment of college entrants. But they might view the military as a positive career option if the military targets individuals who are near graduation or who are considering leaving without a degree.

Although we report results for two-year and four-year students separately, we estimate the model with two-year and four-year students pooled. Hence, the results indicate a group's eligibility characteristic and decision characteristic potential with all students after five years, not just students enrolled in the same type of institution. As in the previous set of results, we report marginal effects and indicate which variables had statistically significant coefficient estimates.

For the two-year students, we find that among the eligibility characteristics, there are both positive and negative marginal effects in each column. However, more eligibility characteristics appear to be found among the dropout group than among the other two groups (Table 4.7). Simulations of predicted probabilities confirm what this pattern suggests: Among the two-year groups five years after graduating, we are most likely to find individuals will all desirable eligibility characteristics in the dropout group (Table 4.8). The simulated probabilities for two-year students still enrolled or who graduated within five years are nearly the same and are nearly a third of the estimated probability for the two-year dropout group.

We again see evidence of sorting on eligibility characteristics among the four-year students after five years (Table 4.9). When we look at the four-year entrants five years later, we observe for many characteristics that we are likely to find individuals with these characteristics in all three groups. More of the coefficients estimated for the four-year groups are positive as a whole than was true for the two-year groups. Again, the simulated probabilities of finding a student in each group with all the desirable eligibility characteristics are consistent with this (Table 4.8). The predicted probability for each of the four-year groups is higher than all the two-year groups except dropouts. The predicted probability for four-year dropouts is many orders of magnitude higher than any of the other estimates, indicating that recruiters are highly likely to identify individuals in this group who exhibit the eligibility characteristics.

Table 4.7

Marginal Effect of Eligibility Characteristics on the Probability of Being in Each Two-Year Group Five Years After Entry

Characteristic	Two-Year Dropouts	Two-Year Graduates	Two-Year Still Enrolled
High school graduate	0.071**	–0.429**	–0.007
Grade point average	–0.017*	–0.009	–0.002
No remedial math	0.004	0.081	–0.010
No remedial reading	0.055***	–0.213***	0.002
High mechanical ability	0.080*	–0.039***	–0.002**
High writing ability	0.015***	–0.145***	0.003
High leadership ability	–0.036**	–0.051	–0.007
U.S. citizen	0.014	0.102	–0.011
Healthy	–0.135*	0.077***	–0.015*
No disabilities	0.068*	–0.047*	–0.011**
No children	–0.058**	–0.032	–0.013**
Community service	0.035*	–0.005	0.003

SOURCE: Results in Table G.3.

NOTE: 0.000 indicates marginal effects lower than 0.001. *Coefficient estimates are statistically significant at the 0.10 level; **statistically significant at the 0.05 level; ***statistically significant at the 0.01 level.

Table 4.8

Predicted Probability of Observing Students with All Desirable Eligibility Characteristics in Each Group Five Years After Entry

Group	Predicted Probability
Two-year dropouts	0.109
Two-year graduates	0.036
Two-year still enrolled	0.038
Four-year dropouts	0.644
Four-year graduates	0.079
Four-year still enrolled	0.094

NOTE: See Appendix F for estimation details.

Among the college groups five years after entry, we find additional evidence of group differences in decision characteristics, but the patterns differ from those of eligibility characteristics. Among two-year entrants, quite a few decision characteristics are associated with

Table 4.9

Marginal Effect of Eligibility Characteristics on the Probability of Being in Each Four-Year Group Five Years After Entry

Characteristic	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
High school graduate	0.227	0.160	–0.021
Grade point average	0.059***	–0.048*	0.017**
No remedial math	–0.158	0.053	0.030
No remedial reading	0.149	–0.078	0.086
High mechanical ability	0.037	–0.036*	–0.039***
High writing ability	0.036	0.064	0.026
High leadership ability	0.021	0.070**	0.002
U.S. citizen	–0.145	0.109	–0.068
Healthy	0.044***	0.014***	0.015***
No disabilities	0.022	0.018	–0.051*
No children	–0.103**	–0.059	0.033
Community service	0.020	–0.048*	–0.004

SOURCE: Results in Table G.3.

NOTE: 0.000 indicates marginal effects lower than 0.001. *Coefficient estimates are statistically significant at the 0.10 level; **statistically significant at the 0.05 level; ***statistically significant at the 0.01 level.

being in both the dropout and graduate categories (see Table 4.10). The marginal effect estimates for those still enrolled in two-year institutions five years later are very close to zero. The simulation results indicate that when both eligibility characteristics and decision characteristics are included, we are most likely to find candidates who would be both eligible for and interested in the military in the two-year dropout and graduates group (Table 4.11). In fact, not only are the predicted probabilities for these two groups nearly identical, they are much larger than the estimates for any of the other groups five years after beginning college. While the similar predicted probabilities might imply that both groups should be equally sought after by recruiters, it may be that recruiters should prefer the two-year dropout group. This is because it is likely that two-year graduates command more of a premium in the labor market (as discussed in Chapter One) and therefore would be more difficult to recruit, on average, than dropouts.

Table 4.10

Marginal Effect of Decision Characteristics on the Probability of Being in Each Entry Group

Characteristic	Two-Year Dropouts	Two-Year Graduates	Two-Year Still Enrolled
White (non-Hispanic)	0.019**	–0.136**	–0.002
Black (non-Hispanic)	0.289*	–0.112***	–0.006**
Other Race (non-Hispanic)	–0.104*	–0.188***	–0.012*
Mother's education less than high school	0.031*	0.063	–0.002
Family SES <= 25th percentile	0.047**	–0.094**	–0.006
Not full-time student	–0.014	0.037	0.001
Unemployed	–0.114*	0.115***	–0.012*
Hours worked in school	–0.003*	0.000*	–0.000
Never married	0.087	–0.043	0.005
Working and enrolled	0.208**	0.062**	–0.004***
Father's occupation not professional	0.041**	0.056	–0.003
Mother's occupation not professional	0.066**	–0.070***	0.007
Future occupational expectation not professional	–0.014**	0.070**	–0.002
Doesn't expect more education	–0.042**	0.201***	0.034**
Wants to get away	0.083**	–0.046***	–0.001
Income not important	–0.083*	0.040***	0.002*
Job security important	0.075*	0.009	0.020***
Lives close to home	0.044**	0.064	0.035***

SOURCE: Results in Table G.3.

NOTE: 0.000 indicates marginal effects lower than 0.001 . *Coefficient estimates are statistically significant at the 0.10 level; **statistically significant at the 0.05 level; ***statistically significant at the 0.01 level.

Table 4.11

Predicted Probability of Observing Students with Desirable Eligibility and Decision Characteristics in Each Group Five Years After Entry

Group	Predicted Probability
Two-year dropouts	0.435
Two-year graduates	0.433
Two-year still enrolled	0.036
Four-year dropouts	0.025
Four-year graduates	0.071
Four-year still enrolled	0.000

NOTE: See Appendix F for estimation details.

In the case of four-year students, the most positive marginal effects are in the four-year graduate category (Table 4.12). The marginal effect estimates for the group that is still enrolled after five years are also very small among four-year students. The small number of positive marginal effects estimated among the eligibility characteristics leads to very different results for the four-year dropouts in the simulation of predicted probabilities that includes both eligibility and decision characteristics (see Table 4.11). If only eligibility characteristics are included, the simulation shown in Table 4.8 suggests that dropouts might be a very promising source of recruits. However, if decision characteristics are added, four-year dropouts are the next-to-least likely category of individuals whose characteristics would raise the probability of enlisting. If both types of characteristics are considered, huge differences do not exist between the estimated probabilities for the four-year groups. Thus, although four-year entrants are likely to exhibit characteristics that indicate they are likely to be eligible to enlist, the results in Tables 4.11 and 4.12 suggest that they are unlikely to have a strong desire to enlist, relative to two-year dropouts and graduates.

Our findings on enlistment potential suggest that recruiting efforts should be targeted toward two-year students and two-year dropouts in particular. However, dropouts might be a potentially undesirable group if they dropped out because of low aptitude or low fortitude. Therefore, we take a closer look at the two-year dropout group to

Table 4.12

Marginal Effect of Decision Characteristics on the Probability of Being In Each Entry Group

Characteristic	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
White (non-Hispanic)	0.148	–0.030	0.002
Black (non-Hispanic)	–0.025*	–0.165***	0.019
Other race (non-Hispanic)	0.367**	–0.061	–0.001
Mother's education less than high school	–0.052*	0.001	–0.042**
Family SES <= 25th percentile	–0.101	0.101	0.052
Not full-time student	–0.019	–0.001	–0.003
Unemployed	–0.110	0.079***	0.042**
Hours worked in school	–0.000	0.002***	0.000**
Never married	–0.104	0.004	0.050
Working and enrolled	–0.113***	–0.105***	–0.049***
Father's occupation not professional	–0.086**	0.003	–0.012
Mother's occupation not professional	0.008	0.020	–0.031**
Future occupational expectation not professional	–0.032	0.015	–0.037
Doesn't expect more education	–0.092	–0.077	–0.023
Wants to get away	–0.097***	0.071	–0.011**
Income not important	–0.005**	0.055***	–0.008
Job security important	–0.069***	–0.028**	–0.007*
Lives close to home	–0.062**	–0.032	–0.049**

SOURCE: Results in Table G.2.

NOTE: 0.000 indicates marginal effects lower than 0.001. *Coefficient estimates are statistically significant at the 0.10 level; **statistically significant at the 0.05 level; ***statistically significant at the 0.01 level.

determine whether they have characteristics that indicate they are undesirable, particularly in terms of eligibility characteristics. We also want to determine if they exhibit any characteristics that might suggest recruiting strategies for this group. For instance, if we find that dropping out is related to high college costs or the lack of financial aid, it may suggest that financial aid programs would be particularly effective recruiting strategies for this group. In Table 4.13, we draw from the results in Table G.3 to highlight characteristics that

predict whether a two-year student drops out. We also examine whether important eligibility characteristics are associated with dropping out. In addition, Table 4.13 reports whether dropping out is associated with characteristics related to financial aid or college costs.

We find that several characteristics predict dropping out. Those whose mothers have less education or whose parents are not in a professional occupation are more likely to be dropouts, all else equal. Both of these are positive attributes from the military's perspective because they make dropouts more likely to enlist. Similarly, working while in school and having lower family income are positively related to being a dropout. Again, these attributes are associated with being likely to enlist. Other variables that predict being a dropout include living close to home and wanting to move away from their home area, both of which are positively related to the decision to enlist. Another characteristic associated with dropping out is valuing job

Table 4.13

Summary of Characteristics Related to Probability of Dropping Out of Two-Year College Within Five Years of Entry

Decision characteristics predicting dropping out of two-year college	
Less mother's education	Lower family income
Worked while in school	Parents have non-professional job
Future job security important	Lives close to home (while in school)
Would like to move away from home area	
Eligibility characteristics related to dropping out of two-year college	
Unhealthy	Has children
Did not take remedial courses	High mechanical ability
High school diploma	Community service
No disabilities	
Characteristics associated with college finances and related to dropping out of two-year college	
Less likely to be financial aid recipient	Got less aid but at lower-cost school
Less likely to be a dependent	

SOURCE: Results in Table G.3.

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security in future employment. In general, the decision characteristics associated with dropping out do not lower an individual's desirability as a recruit from the military's perspective.

In terms of eligibility characteristics, we see that individuals with several undesirable characteristics are more likely to be two-year college dropouts. In general, however, two-year dropouts exhibit a large number of desirable eligibility characteristics. On the negative side, individuals who are unhealthy and have children are more likely to be two-year dropouts; on the positive side, individuals who have traditional high school diplomas (rather than alternative high school credentials), who have not taken remedial courses, and who self-report that they have high mechanical ability are also more likely to be two-year dropouts. Similarly, individuals without disabilities and who have done community service are more likely to be two-year dropouts.

Note that our analysis captures only measurable individual characteristics. It may be that dropouts are undesirable recruits because of characteristics not measured in the BPS. For instance, college dropouts may have high attrition in the military. This argument is similar to the reason high school graduates are preferred to non–high school graduates: High school graduates have lower attrition. In addition, there may be other unobservable factors among segments of the college population that this study cannot address. As more college-bound youth are recruited into the enlisted force, this is a topic that deserves attention.

Several financial aid variables predict two-year dropout status. Individuals who did not get financial aid were more likely to be two-year college dropouts—as were individuals who got less aid. However, two-year dropouts tended to be at lower-cost schools. Finally, individuals who were not listed as their parents' dependents were more likely to be two-year dropouts. These characteristics suggest that recruiting tools such as college financial aid are likely to be just as important for this group as for other segments of the college market and perhaps even that two-year dropouts would be very responsive to financial aid incentives. In sum, the characteristics that predict dropping out are largely decision characteristics that the military does not care about from an eligibility perspective, but they have implications

for policy design because they indicate that financial aid issues probably played a role in two-year students dropping out.

ANALYSIS OF POLICIES TO ATTRACT YOUTH IN THE COLLEGE MARKET

The services currently have an array of policies that they use or are experimenting with to attract college-bound youth into the enlisted force. The largest current program is the MGIB and the College Funds, which offer financial aid to members for college attendance after they have completed a service obligation.[6] A number of smaller scale-programs, such as the Loan Repayment Program and the Advanced Promotion for Education program, target the college market. In this section, we evaluate the features of some existing programs and explore alternative options for attracting college-bound youth. In addition to the programs we discuss in this section, the Navy is also experimenting with a new "Tech-Prep Program" at several community colleges. This program is available to students in the nuclear field and the Advanced Electronics/Computer Field (AECF). Tech Prep students can begin to earn college credit while in high school. In the fall after high school graduation, students enroll at their local community college. The balance of their college credit requirements are fulfilled by their Navy technical training because the Navy courses are accredited by the American Council of Education. The Navy also recently developed a program that offers high school graduates who agree to enter a nuclear field occupation the opportunity to attend community college before enlistment and to earn basic pay while they are enrolled.

The Army is also experimenting with a program that targets college-bound youth. This program, called the "college-first" program, permits high school graduates who commit to a four-year enlistment to attend college for two years before enlistment. The Army pays a stipend of $150 per month, pays an $8,000 "high-grad" bonus, and repays up to $65,000 in federal loans. We do not discuss these pro-

[6]Unlike the Montgomery GI Bill, which is offered to all enlistees, the College Funds are offered only to high-quality recruits in hard-to-fill occupations. An analysis of the use and relative size of these programs is given in Chapter Two and in Asch, Kilburn, and Klerman (1999).

grams, since they are new, small in scale, and relatively little information is currently available about them. Instead, we focus on the long-standing core programs the services have used to target college-bound youth.

Note that it is possible to combine service and college in the officer corps, which offers attendance at military academies and ROTC programs at college campuses. However, the number of new officers per year represents less than 10 percent of new military entrants annually. Furthermore, these programs are restricted to individuals who want to become officers, are generally highly selective, and are not open to two-year college students (Thirtle, 2001).

The overall framework we use to examine these programs is again based on the random utility model that formed the basis of the estimation in the previous section. We assume that individuals compare their post-high school options, such as enlisting or entering college, and will choose the option that yields the greatest utility. Note that the programs mentioned above, which are designed to attract college-bound youth, combine military service and college. In this section, we consider the costs and benefits that influence youth's post-high school choices and identify policy levers the military can use to reduce the costs of military service or raise the benefits of service relative to the other alternatives. In doing so, we focus on alternatives that include military service and attending college and ignore options such as labor force employment or working in the home immediately following high school. In addition to considering the benefits and costs of the various programs to the individual, we also discuss some of the potential benefits and costs to the military. Note that because we have not conducted experiments or statistical evaluations of the current programs, our discussion is based on previous research and theoretical considerations.

Table 4.14 presents examples of potential costs and benefits of military service and college attendance. Examples of benefits of military service might include serving one's country, receiving on-the-job training, gaining work experience, and traveling. Costs of military service might be job-related safety risks and being separated from one's family. Each of these costs and benefits represents a potential

Table 4.14

Examples of Costs and Benefits of Enlisting and Attending College

	Costs	Benefits
Enlisting	Job-related safety hazards Separation from family Frequent relocation	Service to country On-the-job training Work experience Travel opportunities
Attending college	Tuition Living expenses while in school Foregone earnings while in school	Much higher earnings than high school graduates Prestige

policy lever the military could use to change the attractiveness of enlisting. For example, the military could raise the relative attractiveness of military service by improving some of the benefits of military service, such as expanding the value of on-the-job training. In addition, military service might also become more attractive if the costs of military service to the individual were reduced—by minimizing the number of times a member had to move, for instance.

One way to develop new recruiting policies designed to attract youth in the college market is to consider approaches that make enlisting and attending college a joint choice rather than an "either/or" choice. From this perspective, the policies could either reduce the costs of enlisting and attending college or raise the benefits of enlisting and attending college, relative to other choices.

Note that the Montgomery GI Bill and the College Funds—the primary policies the military currently uses to attract youth in the college market—address only two types of college costs in Table 4.14: tuition and living expenses. That is, to make military service with college attendance more attractive than simply attending college, the military relies heavily on a program that lowers tuition and living costs. However, it is clear from the table that other costs and benefits associated with college attendance could be incorporated into a successful military recruiting policy. These items include the earnings foregone while in school and the benefits of attending college, the

most notable of which is the lucrative civilian return to college experience.

Existing Programs to Combine College and Military Service

Past research indicates that educational benefits in the form of the MGIB and College Funds programs are a cost-effective approach to recruit high-quality youth. However, from the perspective of the youth, the MGIB and College Funds have serious drawbacks because they either require members to leave the service in order to receive their full benefit or require members to attend college while they are in service.

An alternative approach to attract youth in the college market is to allow youth to attend college prior to enlistment.[7] The services, particularly the Army, already have some experience with using this approach. For example, the Army's Loan Repayment Program provides up to $65,000 in college loan repayment to eligible recruits with some college and federal loan debts. In addition, the Army's Advanced Promotion for Education program allows individuals to enter service as E-3s if they have two years of college. As we describe below, these programs have either been small in scale or have not provided a large financial return to recruits with some college education.

Figure 4.1 shows the participation rate among Army high-quality recruits in the Loan Repayment Program in recent years. Although the program has grown over time, few recruits—less than 5 percent of the recruits in FY96 and less than 1 percent in FY00—have entered the Army under this program.[8] The program may have been small in

[7] The military offers a variety of educational programs that allow enlisted members to attain postsecondary education *while* they are in service. For example, many servicemembers use tuition assistance to attend community college while they are in the armed forces. Consequently, about half of those in their first enlistment term have some college (Asch, Hosek, and Warner, 2001). On the other hand, as shown in Asch, Kilburn, and Klerman (1999), relatively few servicemembers actually attain a bachelor's degree before year of service 12. Therefore, while these programs have beneficial effects on other personnel outcomes, such as improved retention, they do not necessarily offer youth the opportunity to attain a college degree soon after graduation from high school.

[8] The numbers in Figure 4.1 were provided by John Warner using the Army's mini-master and enlisted master files, which are used by the Army to track enlistment con-

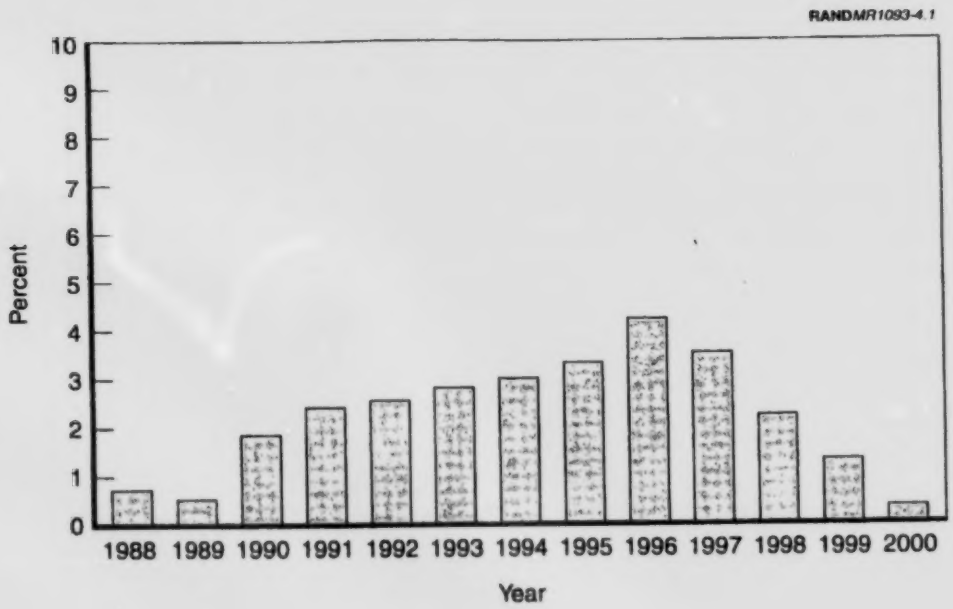


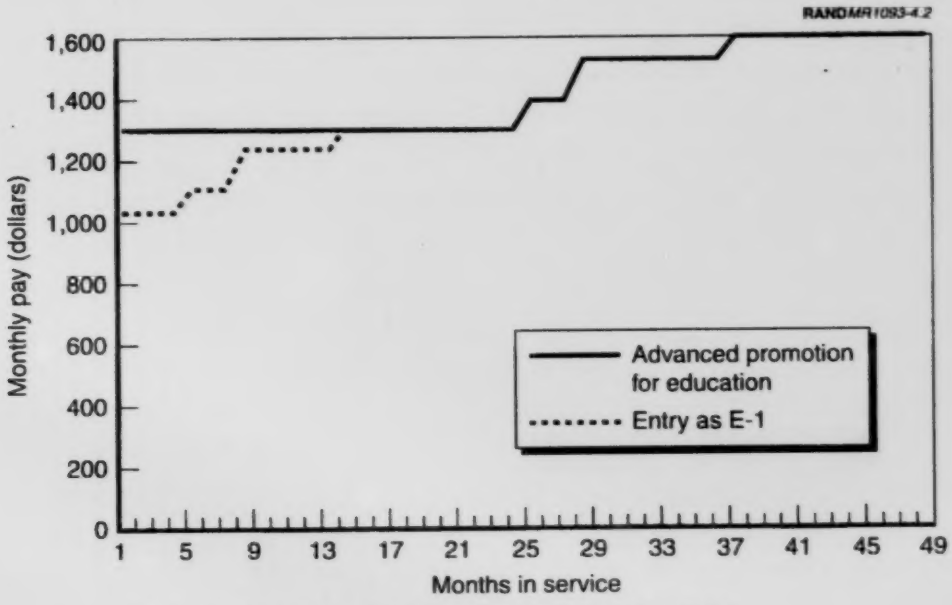
Figure 4.1—Percentage of Army High-Quality Recruits Who Take the Loan Repayment Option

part because of its cost; in part because the Army has tended to focus its recruiting efforts on high school seniors and graduates and not on college students and dropouts who might be interested in the program. The Army has argued that the program has simply not been popular. That is, the Army would use it more if potential enlistees found it attractive. Evidence provided in Tables 4.11 and 4.12 lends some empirical support to that argument. Insofar as the program has traditionally targeted four-year dropouts—a group with the potential for substantial federal student loan debt—we find that four-year dropouts tend to have lower enlistment potential relative to other groups. In addition, in the BPS data we found that the majority of students did not have outstanding college loans. Among two-year students, less than 10 percent had outstanding loans when they left

tracts. The numbers are used with the permission of the U.S. Army Recruiting Command. Because the absolute number of high-quality accessions declined over the time period shown in Figure 1, due to the defense drawdown, the growth in the absolute number of accession who opt to take the loan repayment program is not quite as dramatic as Figure 4.1 suggests, especially between the period 1990 and 1994.

school; among four-year students, this number was less than 25 percent. Whatever the reason, this program has not been on a scale large enough to suggest that it has been an important means of attracting college-bound youth in the past.

Another way the Army has tried to attract college-educated youth into service is through the Advanced Promotion for Education program. This program allows enlistees who have some college credits to enter the military at a higher pay grade. For example, an individual with an AA degree can enter as an E-3. Using mean promotion times across DoD for FY99 and the January 2002 pay table, and assuming a personal discount rate of 10 percent, we find that the difference in the discounted present value of first-term basic pay for someone entering as an E-3 and someone entering as an E-1 is not large—about 4 percent. Figure 4.2 shows how monthly pay would vary with months in service during the first enlistment term for an individual who enters as an E-3 instead of as an E-1. The first-term pay difference is small because the pay of an individual who enters as an E-1 quickly catches up to the pay of someone entering as an E-3, given the amount of time it takes to become an E-4 and E-5 on average. Of



SOURCE: Author's calculations based on 2002 Pay Table.

Figure 4.2—First-Term Basic Pay for E-1 Entrant and E-3 Entrant

course, it may be that those who enter with more education will be promoted faster than average. This will increase the pay gap shown in Figure 4.2, but not by much. For example, even if the time to E-5 were reduced by 25 percent for college-educated youth, the pay gap in the first term would be trivial given that relatively few members achieve E-5 in their first term. This result suggests that the relative return to an AA degree is small during the first enlistment term under this program. Directly comparable figures to those in Figure 4.2 are unavailable for civilians in their first four years of job tenure. However, available evidence from the civilian labor market suggests that a much larger relative return to college can be had in the civilian labor market than in the military. For example, the percentage difference between the mean earnings of an 18- to 24-year-old with an AA degree versus an 18- to 24-year-old with a high school diploma is 33 percent (Bureau of the Census, 1999, Table 226).

New Policy Alternatives

In designing new approaches to targeting college-bound youth, a number of factors can be varied to generate alternatives. For instance, policies to attract college-bound youth could include military service before, during, or after college. The desirability of these options would depend on which segment of the college-bound market the policy targeted, other features of the program, the transferability of the education and training to the civilian sector, and other features. In fact, one alternative way to structure programs is to make their features flexible rather than fixed, so that candidates can select the menu of program options that best meet their needs. For example, a potential recruit with some college credits might select loan repayment, military service concurrent with college completion, and only a small military pay premium, whereas a potential recruit with an associate's degree might prefer a package that includes a large military pay premium with no loan repayment.[9]

To effectively attract large numbers of high-quality youth in the college market, the military must increase compensation to recog-

[9]This approach is similar to "cafeteria style" compensation plans, which allow employees to choose among a set of potential employment benefits such as levels of health care coverage, child care and elder care assistance, flex-time, and others.

nize the relatively better economic opportunities available for high-quality youth who seek a college degree. What form this increase should take is an open question. Compensation for those with some college could be raised by either raising the pay grade at which they enter service, raising the pay grade and the year of service cell at which they enter (e.g., give individuals credit for time spent in college, allowing them to enter at, say, two years of service), increasing their promotion speed, or paying them college enlistment bonuses. Another approach is to raise basic pay over a military career.

Recent military pay raises, including the two-part 2000 pay raise and especially the 2002 pay raise, have recognized the improved external opportunities and the growing educational attainment of military personnel and of the high-quality youth the military seeks to recruit. The initial recruiting and retention results have been positive since the 2000 pay legislation, and policymakers are cautiously optimistic (Asch et al., 2002). Still, recruiting remains an ongoing challenge, and whether recent pay changes are sufficient to ensure competitive military compensation is still open to question.

Raising pay obviously increases personnel costs, and different types of pay approaches result in different cost changes. Increasing basic pay raises pay costs both for recruits who would have entered the military even without a pay raise and for those drawn in by the improvement in military compensation. Programs that allow individuals to attend college prior to enlistment can also raise costs because such individuals are likely to be older than the typical recruit and more likely to have dependents. Therefore, military compensation that partially depends on number of dependents—such as health care and housing—will be higher, also increasing the services' personnel costs. Alternatively, if the policy used to attract the college market is to offer college enlistment bonuses, the bonuses could be targeted toward hard-to-fill occupations and those occupations where the payoff to having a college-educated recruit is the highest in terms of productivity and reduced training costs. An example of the latter type of occupation would be medical technicians. Consequently, the cost of attracting a recruit with some college is likely to be lower when accomplished by a college bonus than by increases in basic pay.

The policies mentioned in the previous paragraph focus on increasing the relative return to college in the military. Such policies might be attractive to two-year entrants, dropouts, and others with some college. Another approach to making military service attractive to youth with some college is to reduce the cost of attending college. Although such an approach might not be attractive to dropouts and others with no plans of returning to school, they might interest two-year students or high school students contemplating two-year college in the near future. Since our analysis suggests that the highest enlistment potential is found among two-year students, a key question is how the military can reduce the cost of attending two-year college.

A common assumption is that two-year students or potential students will be unresponsive to financial aid because their college tuition costs are relatively low (see, for example, Shavelson et al., 1983). Table 4.15 presents estimates of the mean full cost of attending two-year or four-year college for one year. The full cost includes not only the student's time.[10] Since the individual could be working full-time rather than enrolled in school, the time spent away from full-time employment represents a cost of college attendance. As previous studies have noted, two-year college tuition costs are relatively low. The mean annual tuition cost is $1,700 for a two-year

Table 4.15

Estimated Full Mean Annual Cost of Four- and Two-Year Institutions

Cost Item	Four-Year	Two-Year
Mean tuition costs	7,000	1,700
Mean subsistence	5,300	3,700
Opportunity cost of time	18,100	11,400
Total cost	30,400	16,800

NOTE: In 2001 dollars.

[10]The literature sometimes omits subsistence costs from calculations of college costs, reasoning that individuals face subsistence costs even when they are not attending college (see Kane and Rouse, 1999). Omitting subsistence costs does not change the argument in this section.

college, but it is $7,000 for a four-year institution (U.S. Department of Education, 2001).[11] Mean subsistence costs are also higher for four-year students because they are more likely to live in on-campus housing such as dormitories. Dormitories on two-year campuses are quite rare. The mean subsistence costs average about $3,700 for two-year students and $5,300 for four-year students. We estimate that the opportunity cost of time for the two-year students is also lower. This figure is estimated as the mean annual earnings of a high-school graduate working full-time, equal to $24,400, minus the expected average earnings of a student. The expected average earnings of a student is estimated as the probability that the individual is working while enrolled in school times mean annual earnings while enrolled (obtained from the BPS data). That is, the formula is:

$$\$24{,}400 - [(\text{mean earnings while enrolled}) \times (\text{probability working})]$$

Since two-year students are more likely to work while enrolled and consequently earn more on an annual basis as students than do four-year students, their expected earnings as students are larger and the opportunity cost of their time is estimated to be lower. Although each cost item is lower for two-year than for four-year students, two-year students are still estimated to face substantial costs. We estimate the annual full cost of attending two-year college is nearly $17,000 on average—is many times higher than the mean tuition costs of $1,700.

Although their full costs of attendance are relatively high, two-year students are only half as likely to get financial aid. Among BPS entrants, only 23 percent of two-year entrants got any financial aid versus 52 percent of four-year entrants. Furthermore, among those who do get aid, the fraction of their tuition and subsistence costs that was covered by aid was smaller—40 percent rather than 53 percent. The high cost and the relatively low level of aid suggests that two-year students and high school students considering two-year college might be responsive to an appropriately structured military benefit that provided aid, either in the form of a subsistence allowance, basic pay, or even employment in one of the reserve components.

[11]Mean tuition for public four-year institutions was $3,300.

In developing any new policy to attract youth in the college market—be it higher basic pay, financial aid or some other policy—an important element in the successful implementation of the policy will be the development of recruiting processes that support the recruitment of college-bound youth. Shavelson et al. (1984) discuss several reasons why programs launched in the early 1980s to recruit college-bound youth proved unsuccessful. First, some colleges saw the military as a competitor for their students. Consequently, those institutions were reluctant to cooperate with the military's recruiting effort. Second, college recruitment sometimes proved divisive among military recruiters. Recruiters assigned to high school recruitment would often not get credit for the recruitment of a college student. Also, college students are dispersed across a wider geographic area than are high school students, and their recruitment may be difficult to attribute to one recruiting station or recruiter. Third, relative to high school students, getting access to college students was more difficult for recruiters because college students were less likely to have fixed daily schedules and were less likely to be on campus at any given time. In addition, colleges have less well-established policies with regard to military recruiting.[12] Finally, determining whether college students had the requisite knowledge in critical skill areas to justify their lateral entry into higher pay grades sometimes proved difficult.

These problems, as well as the potential for others, suggest that the recruiting process will need to be changed and augmented before the services can successfully recruit a sizable number of college-bound youth. First, recruiters must be selected and trained to effectively target college-bound youth. Traditional selection and training methods focus on the recruitment of high school seniors and graduates. Given that the services have a history of successfully selecting and training recruiters to target the enlistment of those with some college in the medical fields—such as the Army's Army Medical Department (AMEDD) programs—they should consider how they can apply the lessons learned in the recruitment of these personnel to the recruitment of others with some college. In addition, there may be ways to

[12]Note that the 1997 Solomon Amendment, which is also known as the Military Recruiter access to Campus Law, is designed to facilitate recruiting on college campuses. This law allows recruiters to request student enrollment lists from colleges and universities. By comparing successive lists, recruiters could identify individuals who have left the institution.

take advantage of the infrastructure and knowledge that ROTC programs have developed in their efforts to recruit officers from the college-bound population.

Second, the recruiter incentive and quota systems will need to be restructured to recognize the special challenges and conflicts that might arise from the recruitment of those with some college. Third, new lead and prospect development methods may be required to effectively recruit the college-bound market. A special problem posed by the recruitment of college dropouts is that they are more costly and time-consuming to find.[13] In addition, special attention must be paid to ensuring the cooperation of postsecondary institutions, or at least avoiding their animosity. Finally, special programs intended to target the enlistment of college-bound youth must be adequately funded and integrated into the overall recruiting effort to provide them with a fair chance of success.

The services are in the process of developing new methods to generate leads, such as altering their traditional advertising messages and making greater use of the Internet. They are also providing recruiters with new technologies, such as laptop computers, and improving their automation and communication methods (Asch et al., 2002). These improvements in the recruiting processes represent important steps toward successful recruitment of the college market.

SUMMARY AND CONCLUSIONS

Perhaps one of the most remarkable trends in the U.S. labor market in the past two decades has been the dramatic increase in the relative financial returns associated with a college degree and the resulting dramatic increase in college attendance. Today, college interest is strong among a majority of youth.

To aid the services in identifying which groups of youth with some college might have the greatest enlistment potential in terms of being eligible to enlist and being interested in enlisting, we analyzed data from the Beginning Postsecondary Students Study, which tracked the

[13]An alternative to locating promising college students after they have enrolled in or dropped out of college would be to develop ways to identify these candidates in high school and then track them while in college.

college careers of a random sample of college entrants. Our analysis of the characteristics of postsecondary education entrants, two-year and four-year dropouts, graduates, and those still enrolled after five years suggests that the greatest enlistment potential exists among two-year students and two-year dropouts. An important caveat is that most of the individuals we compared have desirable characteristics from an eligibility standpoint. Therefore, even the least-desirable segments of the college pool are likely to be eligible for service.

Current programs that target college-bound youth, such as the Loan Repayment Programs and the Army's Advanced Promotion for Education program, tend to be small in scale. The Advanced Promotion for Education program appears to be inadequate to attract college-educated youth, especially in light of trends in labor market returns to education in the civilian sector. If the military is going to effectively compete for college-educated youth, the returns to education in the military need to be made higher, either through faster promotion, bonuses, or through higher pay or similar policies.

Counter to popular wisdom, two-year students are likely to be responsive to policies that reduce the full cost of attending school, particularly since they are more likely to work while enrolled in school. While most current recruiting policies focus only on one of the costs associated with college attendance—tuition costs—future policies should also consider addressing other costs, such as subsistence costs and forgone earnings. Such policies as basic pay while in school or subsistence pay while enrolled would reduce students' need to work and the opportunity cost of attending school. Both the Army and the Navy have begun to develop such programs, although they are currently small in scale.

Finally, new programs to attract college-bound youth will only be successful if the services commit to making them work and devote adequate resources to them. Changing recruiting processes, such as developing new recruiter training methods, and finding new ways to generate leads may be costly at first, but the alternative—consistently missing recruiting missions and end-strength targets—is even more costly.

Defining the policies and processes that will ultimately lead to the successful recruitment of youth in the college market will take some

experimentation on the part of the services. Each service will need to discover what changes should be made to its recruiting methods to effectively target the college market, and what policies it finds most effective. This experimentation will take some time. Therefore, developing policies to tackle the college market should be part of each service's long-term recruiting strategy.

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RELATIVE RISK RATIOS

Table A.1, A.2, and A.3 provide Relative Risk Ratios to support the results in Chapter Two.

Table A.1

Relative Risk Ratios and Standard Errors for Two-Year College Intentions : Multinomial Logit Model

	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
Variable	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Black female[a]	1.060	.030	2.121***	.067	1.709***	.059
White female	1.120***	.016	1.449***	.024	1.650***	.029
Black male	1.112***	.035	1.685***	.060	1.114**	.047
Living with both parents	.970*	.016	.880***	.016	.949***	.019
Has siblings	1.129***	.016	1.132***	.019	1.069***	.019
Mother works	1.057***	.015	1.104***	.019	1.162***	.021
Mother's education	.973***	.003	.966***	.003	.977***	.003
Father's education	.964***	.002	.954***	.003	.960***	.003
Lives in South[b]	1.045***	.011	.952***	.012	.855***	.011
Lives in West	1.470***	.020	2.118***	.032	2.303***	.035
Lives in Northeast	.662***	.008	.624***	.009	.710***	.010
H.S. GPA C+ [c]	1.119***	.030	1.162	.032	1.280***	.040
H.S. GPA B–	1.094***	.028	1.070**	.029	1.241***	.037
H.S. GPA B	1.031	.025	.883***	.023	1.030	.030
H.S. GPA B+	.941**	.024	.680***	.019	.861***	.026
H.S. GPA A–	.820**	.022	.495***	.016	.584***	.020
H.S. GPA A	.648***	.019	.304***	.012	.379***	.015

Table A.1 (continued)

Variable	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Took college prep course[d]	.757***	.012	.544***	.010	.699***	.014
Took vocational/ technical course	.988	.023	.950**	.023	.986	.026
Used marijuana	.992	.013	1.070***	.017	1.002	.016
Used marijuana missing	.833***	.042	.950	.052	1.001	.060
Hours worked per week	1.007***	.001	1.014***	.001	1.018***	.001
Weekly wages	1.002	.005	1.019***	.006	1.021***	.006
Engaged[e]	.999	.028	1.047	.031	1.149***	.036
Married	.899**	.042	.889**	.046	.860***	.050
Lives in suburbs[f]	.850***	.013	.868***	.017	.772***	.015
Lives in city	.921***	.014	1.029	.018	.926***	.017
Probably Won't join military[g]	3.357***	.052	2.249***	.043	1.697***	.035
Probably Will join military	1.800***	.046	1.490***	.043	.863***	.031
Definitely Will join military	1.107***	.033	.695***	.025	.651***	.026
Probably Won't graduate four-year college[h]	33.951***	1.326	57 211***	2.254	30.188***	1.250
Probably Will graduate four-year college	7.787***	.176	10.222***	.246	5.472***	.147
Definitely Will graduate four-year college	1.391***	.029	.559***	.014	1.033	.026
Survey year 1977[i]	1.024	.040	1.019	.050	.995	.053
Survey year 1978	1.111***	.043	1.090*	.051	1.032	.055
Survey year 1979	1.083**	.043	1.167***	.055	1.049	.057
Survey year 1980	1.015	.040	1.077	.051	1.045	.056
Survey year 1981	1.122***	.044	1.223***	.057	1.289***	.067
Survey year 1982	1.175***	.046	1.309***	.062	1.318***	.070
Survey year 1983	1.143***	.046	1.411***	.068	1.392***	.075
Survey year 1984	1.067	.043	1.285***	.062	1.281***	.069
Survey year 1985	1.081*	.044	1.264***	.062	1.190***	.065
Survey year 1986	1.032	.043	1.297***	.064	1.345***	.073
Survey year 1987	1.033	.042	1.394***	.068	1.487***	.079

Table A.1 (continued)

Variable	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Survey year 1988	.929*	.038	1.409***	.068	1.515***	.080
Survey year 1989	.895***	.037	1.420***	.070	1.560***	.082
Survey year 1990	.864***	.037	1.461***	.073	1.683***	.090
Survey year 1991	1.005	.043	1.763***	.089	2.082***	.111
Survey year 1992	.946	.040	1.728***	.086	1.972***	.104
Survey year 1993	.954	.040	1.770***	.088	1.913***	.102
Survey year 1994	.961	.041	1.628***	.082	1.911***	.102
Survey year 1995	1.015	.043	1.837***	.093	2.061***	.111

NOTE: Definitely Won't graduate from a two-year college is the omitted category.

*p < .10, **p < .05, ***p < .01.

[a]Omitted race/gender category is White Male.

[b]Omitted region is Midwest.

[c]Omitted Grade Point Average category is Below C+.

[d]Omitted high school program category is Regular track.

[e]Omitted marital status is never married nor engaged.

[f]Omitted neighborhood type is rural environment.

[g]Omitted military intention category is Definitely Won't join military.

[h]Omitted 4-Year college intention category is Definitely Won't graduate from four-year college.

[i]Omitted survey year is 1976.

Table A.2

Relative Risk Ratios and Standard Errors for Four-Year College Intentions: Multinomial Logit Model

Variable	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Black female[a]	.939	.017	1.377***	.052	2.624***	.096
White female	.846***	.017	.665***	.013	.732***	.014
Black male	1.230***	.054	1.898***	.079	2.655***	.110
Living with both parents	.991	.021	1.009	.021	1.036*	.021
Has siblings	1.015	.020	1.042**	.020	1.027	.019
Mother works	1.001*	.020	1.014	.019	1.027	.019

Table A.2 (continued)

Variable	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Mother's education	1.023***	.004	1.086***	.004	1.125***	.004
Father's education	1.040***	.004	1.133***	.004	1.171***	.004
Lives in South[b]	1.045***	.015	1.016	.014	1.021	.014
Lives in West	1.122***	.020	1.210***	.021	1.201***	.021
Lives in Northeast	.828***	.014	.770***	.012	.813***	.012
H.S. GPA C+[c]	1.144***	.032	1.407***	.041	1.829***	.057
H.S. GPA B–	1.279***	.036	1.856***	.053	2.815***	.085
H.S. GPA B	1.405***	.039	2.257***	.062	3.812***	.110
H.S. GPA B+	1.522***	.047	2.569***	.078	5.119***	.159
H.S. GPA A–	1.610***	.063	3.076***	.113	7.072***	.259
H.S. GPA A	1.760***	.090	3.442***	.158	10.723***	.472
Took college prep course[d]	1.945***	.044	4.988***	.103	8.431***	.166
Took vocational/ technical course	.794***	.017	.409***	.010	.282***	.008
Used marijuana	.964**	.018	.951***	.017	.875***	.015
Used marijuana missing	.929	.053	.793***	.046	.685***	.040
Hours worked per week	.996***	.001	.986***	.001	.984***	.001
Weekly wages	1.003	.007	1.016***	.007	1.026***	.007
Engaged[e]	.710***	.021	.375***	.012	.285***	.009
Married	.794***	.043	.567***	.032	.535***	.030
Lives in suburbs[f]	1.186***	.028	1.759***	.039	1.943***	.042
Lives in city	1.118***	.023	1.429***	.028	1.565***	.030
Probably Won't join military[g]	1.922***	.043	1.675***	.036	1.411***	.031
Probably Will join military	1.399***	.044	.940**	.030	.676***	.022
Definitely Will join military	1.172***	.044	.675***	.025	.482***	.017
Probably Won't graduate two-year college[h]	30.065***	1.170	6.755***	.155	1.204***	.026
Probably Will graduate two-year college	48.372***	1.894	8.350***	.201	.491***	.012

Table A.2 (continued)

Variable	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Definitely Will graduate two-year college	25.099***	1.037	4.188***	.113	.860***	.021
Survey year 1977[i]	.959	.048	.967	.047	1.013	.050
Survey year 1978	.983	.048	.995	.048	1.123**	.055
Survey year 1979	1.027	.052	1.066	.052	1.280***	.064
Survey year 1980	1.090*	.056	1.144***	.057	1.546***	.078
Survey year 1981	1.097*	.055	1.224***	.060	1.603***	.079
Survey year 1982	1.099*	.055	1.099*	.054	1.501***	.075
Survey year 1983	1.118**	.058	1.116**	.057	1.688***	.086
Survey year 1984	1.073	.056	1.151***	.059	1.835***	.094
Survey year 1985	1.076	.057	1.262***	.065	2.015***	.104
Survey year 1986	1.178***	.065	1.539***	.082	2.440***	.130
Survey year 1987	1.213***	.067	1.632***	.087	2.993***	.159
Survey year 1988	1.135**	.064	1.735***	.092	3.177***	.168
Survey year 1989	1.094	.062	1.680***	.089	3.091***	.163
Survey year 1990	1.235***	.072	1.691***	.094	3.398***	.186
Survey year 1991	1.346***	.080	2.020***	.115	4.289***	.242
Survey year 1992	1.187***	.072	2.126***	.121	4.643***	.261
Survey year 1993	1.323***	.081	2.289***	.132	4.854***	.277
Survey year 1994	1.219***	.076	2.140***	.124	4.200***	.242
Survey year 1995	1.366***	.086	2.245***	.133	4.652***	.274

NOTE: Definitely Won't graduate four-year college is the omitted category. *p < .10, **p < .05, ***p < .01.

[a]Omitted race/gender category is White Male.

[b]Omitted region is Midwest.

[c]Omitted Grade Point Average category is Below C+.

[d]Omitted high school program category is Regular track.

[e]Omitted marital status is never married nor engaged.

[f]Omitted neighborhood type is rural environment.

[g]Omitted Military Intentions category is Definitely Won't join military.

[h]Omitted Two-Year College Intentions category is Definitely Won't graduate from two-year college.

[i]Omitted survey year is 1976.

Table A.3

Relative Risk Ratios and Standard Errors for Military Intentions: Multinomial Logit Model

	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
Variable	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Black female[a]	.348***	.010	.794***	.028	.511***	.023
White female	.301***	.010	.160***	.004	.092***	.023
Black male	.786***	.024	2.167***	.073	2.409***	.088
Lives with both parents	.967***	.015	.787***	.018	.723***	.019
Has siblings	1.045***	.014	1.083***	.024	1.103***	.028
Mother works	1.084***	.014	1.172***	.026	1.392***	.039
Mother's education	.994**	.003	.972***	.020	.974***	.005
Father's education	.995**	.002	.984***	.004	.969***	.004
Lives in South[b]	1.084***	.011	1.184***	.018	1.115***	.021
Lives in West	.950***	.011	.975**	.020	1.045*	.025
Lives in Northeast	1.008	.011	1.013	.018	.916***	.020
H.S. GPA C+[c]	.908***	.021	.871***	.028	.963	.036
H.S. GPA B–	.874***	.020	.793***	.025	.940	.036
H.S. GPA B	.909***	.020	.764***	.024	.958	.035
H.S. GPA B+	.923***	.021	.729***	.025	.885***	.037
H.S. GPA A–	.996	.025	.703***	.029	.830***	.042
H.S. GPA A	1.043	.028	.684***	.033	.860***	.049
Took college prep.course[d]	1.048***	.015	.827***	.020	.674***	.020
Took vocational/ technical course	1.148***	.023	1.015	.028	.895***	.029
Used marijuana	.930***	.011	1.047**	.021	.891***	.021
Used marijuana missing	1.097**	.050	1.513***	.087	1.009	.075
Hours worked per week	1.006***	.001	1.009***	.001	1.006***	.075
Weekly wages	.981***	.005	.977***	.007	.980**	.008
Engaged[e]	.793***	.021	.731***	.032	.990	.048
Married	.927*	.021	1.043	.063	1.042	.074
Lives in suburbs[f]	.915***	.013	.849***	.021	.726***	.023
Lives in city	.833***	.012	.833***	.019	.803***	.022

Table A.3 (continued)

Variable	Probably Won't Graduate		Probably Will Graduate		Definitely Will Graduate	
	Estimated	Std. Error	Estimated	Std. Error	Estimated	Std. Error
Probably Won't graduate four-year college[g]	1.760***	.038	1.284***	.039	1.090**	.039
Probably Will graduate four-year college	1.534***	.032	.090***	.028	.682***	.025
Definitely Will graduate four-year college	1.282***	.027	.628***	.020	.478***	.017
Probably Won't graduate two-ear college[h]	3.310***	.051	1.852***	.048	1.178***	.035
Probably Will graduate two-year college	2.233***	.042	1.618***	.047	.785***	.028
Definitely Will graduate two-year college	1.670***	.034	.934*	.033	.743	.030
Survey year 1977[i]	.858***	.030	.722***	.041	.866**	.067
Survey year 1978	.737***	.026	.625***	.036	.736***	.058
Survey year 1979	.782***	.028	.667***	.039	.692***	.057
Survey year 1980	1.025	.036	.892**	.051	.972	.077
Survey year 1981	.859***	.030	.833***	.046	1.027	.077
Survey year 1982	.832***	.029	.894**	.050	1.139*	.085
Survey year 1983	.846***	.031	1.053	.059	1.552***	.114
Survey year 1984	.752***	.027	.810***	.047	1.335***	.099
Survey year 1985	.707***	.026	.846***	.049	1.360***	.101
Survey year 1986	.729***	.027	.881**	.052	1.608***	.120
Survey year 1987	.626***	.024	.851***	.050	1.426***	.107
Survey year 1988	.557***	.021	.683***	.041	1.376***	.102
Survey year 1989	.488***	.019	.611***	.037	1.218***	.091
Survey year 1990	.482***	.019	.505***	.033	1.155*	.088
Survey year 1991	.533***	.021	.591***	.038	1.057	.083
Survey year 1992	.468***	.019	.546***	.035	.995	.078
Survey year 1993	.460***	.018	.516	.033	.982	.078
Survey year 1994	.417***	.017	.472***	.032	.943***	.076
Survey year 1995	.434***	.018	.486***	.032	.856*	.071

Note: Definitely Won't join the military is the omitted category.

* p < .10, **p < .05, *** p < .01.

[a]Omitted race/gender category is white male.

[b]Omitted region is Midwest.

[c]Omitted Grade Point Average category is Below C+.

[d]Omitted high school program category is Regular track.

[e]Omitted marital status is never married nor engaged.

[f]Omitted neighborhood type is rural environment.

[g]Omitted four-year college intention category is Definitely Won't graduate four-year college.

[h]Omitted two-year college intention category is Definitely Won't graduate two-year college.

[i]Omitted survey year is 1976.

Appendix B

MULTINOMIAL LOGIT COEFFICIENTS FOR YEAR OF SURVEY

The tables in this appendix display the Multinomial Logit coefficients (in Relative Risk Ratios) for the variables in Chapter Two that indicate year of survey. The year variables are dummy coded, with 1976 as the reference category. The Relative Risk Ratios presented in each table, therefore, represent the multiplicative effect of each year relative to 1976 on the odds of having a given level of propensity for the stated activity.

Table B.1 displays the year coefficients for two-year college intentions. In general, the results show that from 1981 on, the odds that students will state they either Probably Will or Definitely Will graduate from a two-year college increased relative to 1976. The coefficients are generally larger for the Definitely Will category, indicating that time has larger effects on the probability of having definite rather than probably probable positive intentions. For most years, there is no significant difference in the odds of stating one Probably Won't graduate from a two-year college. These findings are all consistent with the findings for two-year college intentions reported in Chapter Two: a modest increase in positive propensity combined with increased certainty regarding two-year college.

The year coefficients for four-year college intentions are displayed in Table B.2. Again, these results are consistent with the trends reported in Chapter Two. From the early 1980s on, students were more likely each year to state they Probably Will or Definitely Will graduate from a four-year college. As with the two-year results, the effects of time

Table B.1

Multinomial Logit Estimates for Two-Year College Intentions

Year of Survey	Probably Won't	Probably Will	Definitely Will
1977	ns	ns	ns
1978	1.11	ns	ns
1979	ns	1.16	ns
1980	ns	ns	ns
1981	1.12	1.22	1.29
1982	1.17	1.31	1.32
1983	1.14	1.41	1.39
1984	ns	1.29	1.28
1985	ns	1.26	1.19
1986	ns	1.30	1.34
1987	ns	1.40	1.49
1988	ns	1.41	1.52
1989	.89	1.42	1.56
1990	.86	1.46	1.68
1991	ns	1.76	2.08
1992	ns	1.73	1.97
1993	ns	1.77	1.91
1994	ns	1.62	1.91
1995	ns	1.84	2.06

SOURCE: Monitoring the Future (1976–1995).

NOTES: Coefficients reported are Relative Risk Ratios. ns = not statistically significant. All reported coefficients are statistically significant at the .01 level. Reference category of the dependent variable is Definitely Won't.

are particularly strong for the likelihood of being definitely positive about graduating from a four-year college. From the mid-1980s on, the odds that students will state they Probably Won't (rather than Definitely Won't) graduate from a four-year college also increased.

Table B.3 contains the coefficients for the effect of year of survey on military intentions. These figures show that there was a fairly steady decrease each year (relative to 1976) in the odds that students will say they either Probably Won't or Probably Will join the military. The results also show that the odds they Definitely Will join the military were significantly greater than they were in 1976. From 1990 on, however, the odds that a student would indicate such definite plans

Table B.2

Multinomial Logit Estimates for Four-Year College Intentions

Year of Survey	Probably Won't	Probably Will	Definitely Will
1977	ns	ns	ns
1978	ns	ns	ns
1979	ns	ns	1.28
1980	ns	1.14	1.55
1981	ns	1.22	1.60
1982	ns	ns	1.50
1983	ns	ns	1.69
1984	ns	1.15	1.83
1985	ns	1.26	2.02
1986	1.17	1.54	2.44
1987	1.21	1.63	2.99
1988	ns	1.73	3.18
1989	ns	1.68	3.09
1990	1.23	1.69	3.40
1991	1.32	2.02	4.29
1992	1.18	2.13	4.64
1993	1.32	2.29	4.85
1994	1.21	2.14	4.20
1995	1.37	2.25	4.65

SOURCE: Monitoring the Future (1976–1995).

NOTES: Coefficients reported are Relative Risk Ratios. ns = not statistically significant. All reported coefficients are statistically significant at the .01 level. Reference category of the dependent variable is Definitely Won't.

for military service returned to their 1976 level. As with the coefficients for college intentions, the results for military intentions are generally consistent with the results reported earlier in Chapter Two regarding the trends in postsecondary intentions of high school students.

Table B.3

Multinomial Logit Estimates for Military Intentions

Year of Survey	Probably Won't	Probably Will	Definitely Will
1977	.86	.72	ns
1978	.74	.62	.74
1979	.78	.67	.70
1980	ns	ns	ns
1981	.86	.83	ns
1982	.83	ns	ns
1983	.85	ns	1.55
1984	.75	.81	1.33
1985	.71	ns	1.36
1986	.73	.88	1.61
1987	.63	.85	1.43
1988	.56	.68	1.38
1989	.49	.61	1.22
1990	.48	.51	ns
1991	.53	.59	ns
1992	.47	.54	ns
1993	.46	.51	ns
1994	.42	.47	ns
1995	.43	.49	ns

SOURCE: Monitoring the Future (1976–1995).

NOTES: Coefficients reported are Relative Risk Ratios. ns = not statistically significant. All reported coefficients are statistically at the .01 level. Reference category of the dependent variable is Definitely Won't.

Appendix C

BREAKDOWN OF NUMBERS OF SCHOOLS BY CATEGORY IN EACH STATE

Table C.1

State-by-State Breakdown of Numbers of Schools by Category

	Private		Public	
	AA-Granting (43 states)	BA-Granting (51 states)	AA-Granting (53 states)	BA-Granting (54 states)
Alaska	NA	3	1	3
Alabama	3	16	31	16
Arkansas	2	10	7	10
Arizona	2	9	16	3
California	19	76	82	29
Colorado	7	9	15	14
Connecticut	2	15	12	5
District of Columbia	NA	11	NA	1
Delaware	NA	3	1	2
Florida	6	37	28	9
Georgia	10	25	28	19
Guam	NA	NA	1	1
Hawaii	NA	4	7	3
Iowa	2	34	15	3
Idaho	2	3	2	4
Illinois	10	60	39	12
Indiana	6	33	1	14
Kansas	2	17	21	8
Kentucky	7	22	12	9
Louisiana	1	10	4	15

Table C.1 (continued)

	Private		Public	
	AA-Granting (43 states)	BA-Granting (51 states)	AA-Granting (53 states)	BA-Granting (54 states)
Massachusetts	9	59	17	12
Maryland	3	19	17	13
Maine	5	12	5	8
Michigan	3	33	28	15
Minnesota	4	24	19	10
Missouri	3	35	14	13
Mississippi	2	10	14	10
Montana	3	3	6	6
North Carolina	6	37	58	15
North Dakota	NA	4	4	6
Nebraska	NA	15	7	7
New Hampshire	4	9	3	4
New Jersey	3	15	19	13
New Mexico	1	3	7	6
Nevada	NA	1	4	2
New York	40	114	43	38
Ohio	13	54	23	13
Oklahoma	1	6	10	12
Oregon	NA	17	13	8
Pennsylvania	33	79	32	24
Puerto Rico	5	22	4	9
Rhode Island	NA	8	1	2
South Carolina	4	18	21	12
South Dakota	1	7	1	7
Tennessee	6	32	14	9
Trust Territories	NA	NA	3	NA
Texas	9	47	58	37
Utah	2	3	5	4
Virginia	3	26	23	16
Virgin Islands	NA	NA	NA	1
Vermont	3	11	2	4
Washington	2	16	25	6
Wisconsin	3	23	17	13
West Virginia	2	9	3	11
Wyoming	1	NA	7	1

NOTE: NA = not applicable.

Appendix D

DATA COLLECTION AND ANALYSIS

INSTITUTIONAL DATA COLLECTION

The central part of Chapter Three includes both an analysis of trends in total costs of attending college and a comparison of these costs with financial aid benefits. These analyses required data on tuition and fees, room and board, and fall enrollment. Fall enrollment was required to weight the cost variables (except where stated otherwise, all average costs are enrollment-weighted). We concentrated only on institutions that granted an AA or a BA.

From the IPEDS data, we used the following cost data: in-state tuition and fees and average room and board charges for dormitories.[1] These data were collected for academic years 1990–1996. Over all years, 33 percent (9,983 of 30,121) of schools did not report tuition data. From the Opening Fall Enrollment data source, we obtained information on fall enrollment. Over all years, approximately 21 percent of all institutions (6,374 of 30,121) did not report enrollment information and 21 percent (6,328 of 30,121) did not report both tuition and enrollment data. From the Earned Degrees data source, we obtained the number of AA, BA, or higher degrees granted by each school for the relevant year. Of the 30,121 schools in the raw data file, 8,470 did not grant a certificate, AA, or BA for any given year. (Some of the missing data may be due in part to the fact that in each year

[1]Although tuition data included average costs of books and supplies as well as nondormitory room and board charges, they were not reported often enough to permit use of these variables in our analysis.

schools open and close. Thus, if a school opened in 1993, all the data for previous years would be zero. Alternatively, if a school closed in 1993, all the data for subsequent years would be zero. Thus, we used all schools in *any given year* for which we had all data elements.)

INSTITUTIONAL DATA ANALYSIS

In Chapter Three, cost estimates are generally weighted by opening fall enrollment. Thus, we dropped schools from our data set if they failed to report either tuition or enrollment for any given year or if the amounts reported were zero. Zero values for tuition and enrollment are understood to be missing.[2]

As WebCASPAR contains all accredited institutions, there were some institutions in our data which did not have undergraduate programs. Thus, we used the Earned Degree variable as a proxy for determining whether or not an institution had an undergraduate program. We eliminated schools for any given year if they did not grant either an AA or a BA during that year.[3] It should be noted that military academies are in this sample.

An important determinant of a student's financial aid eligibility is the cost of attendance (COA), a term used in financial aid literature. The COA is determined by rules established by Congress and includes tuition and fees (including costs incurred by renting or purchasing equipment, materials, or supplies required by all students pursuing the same course of study); an allowance for room and board; books and supplies; transportation; applicable loan fees; allowance for dependent care; and allowance for disability-related costs. The COA is adjusted for students attending less than full time. Some exceptions and provisions are noted in *The Student Guide* (http://www.ed.gov/prog_info/SFA/StudentGuide/).

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[2]WebCASPAR indicates missing data with a zero. Thus, we could not discriminate between zero values and those that are missing data. This may not be a problem for tuition as we would not expect tuition to be legitimately zero. However, it may be the case that the number of AA or BA degrees granted could be zero.

[3]We would not expect that the error arising from deleting institutions with undergraduate programs which did not confer a BA or AA in any given year to be significant.

We approximate the COA with the variable "total cost," which we created by adding tuition and fees, typical board charge (dormitory), and typical room charge (dormitory). Throughout this paper, "COA" refers to the cost of attendance as calculated by financial aid entities and "total costs" will refer to our approximation of the COA.

This total cost variable was created only for schools with non-zero data reported for all of the above variables and only for schools granting a BA or higher degree.[4] The latter constraint was imposed because most institutions that grant an AA as their highest degree do not offer room and board for students. As we had extensive data only on dormitory costs, this variable reflects room and board charges on campus.

These constraints may cause our estimates of total cost to be upward biased. First, we can estimate costs only for those schools whose highest degree offered is a BA or above. Second, we do not have extensive data on off-campus room and board expenses. Because students at AA-granting institutions are likely to live off-campus and because we may expect on-campus room and board charges to be greater than off-campus charges, these total-cost estimates will be overestimated.

To facilitate comparisons with data from the various financial aid regimes, including military benefits, for academic and fiscal years beyond 1995–1996, the costs of attendance were projected outward from our time series 1986–1995. This was done by utilizing the Consumer Price Index for All Urban Consumers (CPI-U), U.S. city average, detailed expenditure categories *for college tuition.* The growth in this index calculated between 1995 and 1996 was 5.7 percent, and the growth observed between 1996 and 1997 was 5.1 percent. These rates were used to project costs for AYs 1996–1997 and 1997–1998. The variance in growth has been small, indicating that our estimates are likely to be reasonable estimates of the realized value.

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[4]We found a statistically insignificant, but consistent across time, difference in average tuition between schools that report costs of living than those that did not report such cost of living data—particularly among private schools with HDG of BA or BA and Higher (BA+).

The accounting year for academic institutions, the military, and Consumer Price Index are different. Tuition and other institutional data are reported for academic years, which strictly speaking run from July 1 to June 30. The military data are generally reported for fiscal years, which begin on October 1.[5] The yearly average for the college tuition CPI-U runs from January to December. Thus the growth rate in the annual CPI-U for college tuition between 1996 and 1997 was applied to Fall 1996 cost variables to estimate AY 1997–1998 cost variables. Because the start of a given fiscal year coincides with the start of the school year, we can compare, for example, the costs for AY 1995–1996 to military benefits of FY 1996. For instance, Montgomery GI Bill benefits for FY 1996 would be compared to opening fall tuition for AY 1995–1996.

MILITARY EDUCATION BENEFITS DATA

Information on current military education benefits is generally available on the World Wide Web at the relevant service web sites. However, it was often the case that the web sites had not been updated and did not represent present opportunities available. Moreover, historical information on these policies was less accessible. Thus, to fill in missing data for present years and to obtain historical data, we identified appropriate individuals and conducted numerous conversations with them throughout the spring and summer of 1998.[6] These individuals and offices are cited where appropriate.

There is a multitude of military programs by which both enlisted personnel and officers may obtain postsecondary education, both during their service tenure and after (see Thirtle, 2001[7]). However, we concentrated on programs for enlisted personnel. Specifically, we looked at the MGIB Benefits, MGIB plus CF, TA, and LRP. To the extent that the Selected Reserve and National Guard programs provide

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[5]While this is generally the case, it does occur that a given military program will become effective some time within a fiscal year. For example, in March 1997 (FY 1998) a new Army College Fund program became effective.

[6]Attempts to utilize the enabling legislation to understand active service, Selected Reserve and Guards programs did not provide key insights. For example, while a program may be authorized for use by a given service, the service may not have budgeted resources to fund the program.

[7]See Chapter Three reference list for citations in this Appendix.

lucrative alternatives to the active-duty components, we also looked at educational benefits available to members of the Selected Reserves and National Guards.

It should be noted that such programs can vary significantly for different individuals. Loan repayment programs are highly individualized and depend upon the background of the recruit and the needs assessment of the military. Although there are specified maximums and course caps in the TA programs, there are also tremendous opportunities for the local commander's discretion. If funds are available and if it is deemed necessary, individuals may receive more TA than the specified maximums. Similarly, the current maximum College Fund awards are highly restricted to certain MOS outside of the normal MOS chart.[8] As with federal financial aid programs, military education program maximums must be interpreted somewhat loosely, given the degree of local discretion and the high number of restrictions involved.

To obtain historical and current information on the National Guards and Selected Reserve, we used *The National Guard Almanac* and *Reserve Forces Almanac*. However, our discussions with officials in various services suggested that these sources were not always accurate. Collecting data on state-based National Guard programs from each state was beyond the scope of this project.

FEDERAL FINANCIAL AID DATA

We collected current and historical data on federal financial programs offered through the Department of Education as well as the Hope and Lifetime Learning Tax Credit. Current financial aid data may be obtained easily from *The Student Guide* from the Department of Education website: (http://www.ed.gov). The Department of Education, Forecasting and Policy Analysis Unit provided us with historical data.

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[8]Depending on the service, different terminology is used to designate career fields or occupations: The Army uses the term MOS; the Navy uses the term "rating"; the Air Force uses the terms AFSC or simply "career field." Throughout this report, we use only MOS to represent all terminology employed by the various services.

A maximum is guaranteed for only one federal program: the Pell Grant program. Thus, data must be interpreted carefully for other program maximums discussed in this chapter. The federal government does not guarantee these maximums and funding for the programs is subject to extreme local discretion. There is often large variation between the average award and the maximum award. One is cautioned against taking other program maximums as applicable to all individuals.

To adequately understand some of the broader objectives and strategies of financial aid offices, we had several conversations with various persons in the Department of Education and consulted a range of written materials. However, it appears that authoritative policy guidance on "bundling"—the process by which various sources of aid are collected into an aid package—is not readily available. The Program Analyst at the Department of Education Forecasting and Policy Analysis division was helpful in our numerous discussions throughout the spring of 1998. To obtain information available to financial aid professionals, we relied upon the Department of Education Office of Postsecondary Education's website (http://www.ed.gov/offices/OPE/Partners/index.html). Specifically, the *Federal Student Financial Aid Handbook*, available through the web (http://www.ed.gov/offices/OPE/pubs/hbguide) was highly useful in that it served as a set of guidelines to financial aid professionals.

We compare military educational benefits to federal programs, which are the largest source of financial aid for college. However, federal programs are not the only source of financial aid. Thus this analysis is not an exhaustive catalogue of all funding sources available. Additional sources of funding include state, federal, local, or philanthropic allocations that would lower the "actual cost of attendance" faced by students (College Board, 1997). In addition, we do not include in our analysis several other formal and informal programs of funding college also suggested by the College Board (1997), such as merit-based aid, non–work study student wages, family loans, and use of credit cards.

CASE STUDIES OF FINANCIAL AID BUNDLING STRATEGIES

Below are examples of packaging policies of two universities whose policies are available on the web: The Metropolitan State College of Denver (the MET)[1] and Connecticut College.[2] According to the MET packaging policy, students meeting eligibility criteria are ranked. Funds are awarded to those with the highest eligibility for aid programs in the following sequence until all funds are exhausted:

1. Federal Pell Grants
2. Federal and state work-study
3. FSEOG
4. Federal Perkins Loans
5. Colorado Student Incentive Grants
6. Colorado Student Grants
7. Estimated Federal Family Education Loans

Connecticut College claims to distribute funds in an equitable and consistent manner by which financial need, once established, is constructed stepwise according to the following program priority order, until all need is met:

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[1]http:/www.mscd.edu/admission/finaid/handbook/package.html.

[2]http://oak.conncoll.edu/admin/finaid/policies.html.

1. Federal Pell Grants
2. FSEOG
3. Federal work-study
4. Loans (Federal Stafford, Perkins, or Connecticut College)
5. State grants
6. Connecticut College Scholarships

The Department of Education Federal Student Aid Information Center suggested yet a different order of layering:

1. Pell Grants
2. Other non-federal sources of aid: scholarships, military benefits, state aid, etc.
3. Federal work-study
4. Loans: Stafford, then Perkins, then PLUS

Across the three layering methods, the Pell Grant is the foundation upon which all other aid is layered. In fact, this appears to be the case in general, according to the Department of Education Federal Student Aid Information Center. In the MET policy, work-study funds are used before FSEOG grants are considered. Connecticut College, conversely, attempts to provide FSEOG grant aid prior to turning to work-study funds. Both turn to loans only after these three resources have been exhausted or deemed inappropriate for the student's level of need. Both programs resort to state grants only after "self-help" (i.e., loans) have been considered. This is somewhat different from the scheme outlined by the Department of Education, which implies that state aid should be applied prior to the use of loans. It is presently not possible to gauge the extent to which these two college policies are typical of other universities. Nor is it possible to estimate the extent to which universities adopt the layering strategy articulated by the Federal Student Aid Information Center.

Appendix F

DETAILS OF PREDICTED PROBABILITY ESTIMATES

In this appendix, we provide the specifics of the estimation of the predicted probabilities reported in Chapter Four.

RESULTS IN TABLES 4.4 AND 4.8

For Table 4.4, we estimated a multinomial logit model where the outcomes were four-year college entry, two-year college entry, and certificate program entry. For Table 4.8, we estimated a multinomial logit model where the outcomes were the person's educational status five years after entry: two-year dropout, two-year graduate, still enrolled in a two-year college, four-year dropout, four-year graduate, or still enrolled in a four-year college. For both sets of estimates, we included as explanatory variables the eligibility characteristics shown in Table F.1.

No other covariates were included in the model. We then used the results from this model to estimate the predicted probability of being in each of the outcome categories for a simulated individual who exhibits all of the desirable eligibility characteristics (for example, the person has a high school degree, has not taken remedial math, has high leadership ability, is a U.S. citizen, etc.). The predicted probabilities of a person with these characteristics being in each of the three entry groups are reported in Table 4.4, and the predicted probabilities of a person with these characteristics being in each of the categories five years after entry are reported in Table 4.8.

Table F.1

Eligibility Characteristics
(Tables 4.4 and 4.8)

High school graduate	High leadership ability
Higher grade point average	Missing ability measures
No remedial math	U.S. citizen
Missing remedial math information	Healthy
No remedial reading	No disabilities
Missing remedial reading information (not in five-year status model)	No new disabilities between 1989 and 1994
High mechanical ability	No children
High writing ability	Community service

RESULTS IN TABLES 4.6 AND 4.11

We also estimated a multinomial logit model for each of the two sets of outcomes—those at entry and those five years after entry—as a function of the eligibility characteristics listed above plus the decision characteristics listed in Table F.2.

We did not include race and ethnicity in the model. The results from this model were then used to estimate the predicted probability of being in each of the three outcome categories for a simulated individual who exhibits all of the desirable eligibility characteristics and decision characteristics shown in other studies to be associated with being likely to enlist in the military (see, for instance, Kilburn and Klerman, 1999[1]). For example, such an individual would have the desirable eligibility characteristics enumerated above and would have a father not in a professional occupation, would report that job security was important, would never have been married, etc. The predicted probabilities of a person with these characteristics being in each of the three entry groups are reported in Table 4.6. The predicted probabilities of a person with these characteristics being in each of the six categories representing status five years after entry are reported in Table 4.11.

[1]See reference list at end of Chapter Four for full citations.

Table F.2

Additional Characteristics
(Tables 4.6 and 4.11)

Mother's education less than high school	Father's occupation missing
Missing mother's education	Mother's occupation not professional
Family SES <= 25th percentile	Mother's occupation missing
Not full-time student	Future occupational expectation not professional
Unemployed	Doesn't expect more education
Hours worked in school	Wants to get away
Never married	Income not important
Working and enrolled	Job security important
Father's occupation not professional	Lives close to home

Appendix G

ADDITIONAL TABLES

The tables in this appendix provide statistical support for the results in Chapter Four.

Table G.1

Variable Means and Standard Deviations, by College Segment
Panel A: College Entrants

	Four-Year College Entrants		Two-Year College Entrants		Certificate Program Entrants		All College Entrants	
Distribution of Entry Status	50.34%		45.13%		4.53%		100%	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
			Eligibility Variables					
High school diploma	.992	.087	.959	.198	.872	.335	.971	.165
Grade point average	2.115	1.194	1.562	1.349	1.014	1.512	1.815	1.320
Remedial math hours 1st year	.937	241	.881	.323	.960	.196	.913	.281
Remedial writing hours 1st year	.943	.231	.905	.292	.973	.161	.927	.259
Self-reported above average mechanical ability	.352	.477	.406	.491	.597	.492	.387	.487
Self-reported above average writing ability	.405	.491	.231	.422	.186	.391	.317	.465
Self-reported above average leadership ability	.464	.498	.390	.488	.310	464	.424	.494
U.S. citizen	.975	.154	.966	.180	.977	.147	.971	.166
Healthy	.540	.498	.516	.500	.429	.496	.524	.499
No disabilities in '90	.930	.254	.919	.271	.914	.280	.924	.263
No children	.075	.342	.145	.434	.207	.543	.113	.398
Ever done community service	.409	.491	.265	.442	.153	.362	.333	.471

Table G.1—Panel A (continued)

Variable	Four-Year College Entrants		Two-Year College Entrants		Certificate Program Entrants		All College Entrants	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Decision Variables								
White	.856	.350	.759	.427	.770	.421	.808	.393
Black, non-Hispanic	.053	.225	.087	.283	.144	.352	.073	.260
Other, non-Hispanic	.043	.204	.031	.176	.005	.073	.036	.188
Mother's education less than high school	.432	.495	.580	.493	.675	.469	.510	.499
SES < 25th percentile	.044	.206	.090	.286	.116	.321	.068	.252
Not enrolled-full time in 1989	.266	.442	.442	.497	.377	.486	.351	.477
Unemployment spell in 1990	.066	.249	.099	.300	.268	.445	.090	.287
Hours worked per week while enrolled	22.131	17.056	26.952	15.275	19.980	17.770	24.210	16.496
Never married	.855	.351	.780	.414	.759	.428	.817	.386
Percentage of enrolled months was working	.498	.428	.734	.385	.507	.454	.605	.426
Father's occupation not professional	.317	.465	.445	.497	.450	.499	.381	.485
Mother's occupation not professional	.386	.487	.447	.497	.458	.499	.417	.493
Future occupation not likely to be professional	.320	.466	.413	.492	.374	.485	.364	.481

Table G.1—Panel A (continued)

Variable	Four-Year College Entrants		Two-Year College Entrants		Certificate Program Entrants		All College Entrants	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Educational expectation low	.006	.083	.065	.246	.534	.500	.057	.232
Getting away from area is important	.335	.472	.402	.490	.457	.499	.371	.483
Income to start not important in future job	.395	.489	.312	.464	.247	.432	.351	.477
Job security important in future job	.715	.451	.802	.398	.889	.314	.762	.425
Lives close to home	.188	.390	.462	.499	.342	.476	.318	.466
Other Control Variables								
Age 19 or 20	.250	.433	.361	.480	.443	.498	.309	.462
Age 21 or 22	.025	.158	.091	.289	.144	.353	.060	.239
Delay entry into college	.090	.286	.284	.451	.451	.499	.194	.395
Region = missing/foreign	.027	.162	.055	.229	.081	.274	.042	.201
Region = East	.091	.287	.045	.209	.127	.334	.072	.259
Region = Great Lakes	.203	.402	.150	.358	.151	.360	.177	.382
Region = Plains	.091	.288	.048	.214	.034	.183	.069	.254
Region = Southeast	.186	.389	.206	.405	.373	.485	.204	.403
Region = Southwest	.107	.309	.065	.248	.055	.230	.086	.280
Region = Rocky Mountains	.027	.164	.027	.162	.004	.065	.026	.160
Region = Far East	.079	.270	.219	.414	.088	.284	.142	.350
Self-reported above average academic ability	.464	.498	.259	.438	.204	.404	.360	.480

Table G.1—Panel A (continued)

Variable	Four-Year College Entrants		Two-Year College Entrants		Certificate Program Entrants		All College Entrants	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Self-reported above average drive to succeed	.556	.496	.513	.500	.400	.491	.530	.499
Self-reported above-average mathematics ability	.430	.495	.305	.461	.265	.442	.366	.482
Mother worked before elementary school	.447	.497	.422	.494	.541	.499	.440	.496
Got married between 1989 and 1994	.098	.297	.122	.328	.121	.328	.110	.313
New disability since 1989	.993	.079	.993	.083	.987	.111	.993	.082
Number of months enrolled in 1989	9.265	1.512	7.757	2.646	7.013	3.124	8.483	2.321
Major = social, behavioral, or life sciences	.085	.279	.031	.176	.006	.080	.057	.232
Major = physical sciences, mathematics, computer or information technology	.055	.229	.038	.193	.147	.355	.052	.222
Major = engineering	.135	.342	.121	.326	.121	.327	.128	.334
Major = education	.017	.129	.034	.183	.001	.041	.024	.154
Major = business and management	.166	.372	.179	.383	.068	.253	.167	.373
Major = health	.041	.200	.014	.121	.003	.059	.027	.164
Major = vocational/ technical	.012	.111	.107	.309	.466	.500	.075	.264

Table G.1—Panel A (continued)

Variable	Four-Year College Entrants		Two-Year College Entrants		Certificate Program Entrants		All College Entrants	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Major = other technical/ vocational	.044	.207	.089	.286	.162	.370	.070	.256
Aid package included grants, no loans	.216	.411	.125	.331	.129	.336	.171	.376
Aid package included grants and loans	.206	.405	.049	.217	.234	.425	.137	.344
Aid package included loans, no grants	.046	.211	.026	.161	.138	.346	.041	.200
Package included other aid	.038	.192	.038	.191	.045	.208	.038	.193
Total financial aid (1989–1990)	2.450	3.712	.592	1.524	2.228	2.620	1.601	3.022
Total college costs (1989–1990)	8.229	5.338	4.905	3.589	7.978	5.349	6.718	4.913
Ratio aid to cost	27.827	35.022	9.982	22.615	25.880	32.769	19.685	31.204
Percentage of aid federal	21.819	34.861	13.214	31.641	49.289	48.941	19.180	35.089
Percentage of aid grants	30.783	39.496	15.319	34.200	17.731	31.250	23.213	37.608
Percentage of aid state	7.730	20.277	3.246	14.198	.588	6.017	5.382	17.472
Percentage of aid institutional	16.148	30.615	3.544	16.008	4.008	16.271	9.910	25.270
Percentage of aid loans	12.514	25.504	4.922	18.548	26.390	37.023	9.716	23.896
Federal aid variable missing	.478	.499	.754	.431	.452	.499	.601	.489
Work seems important/ interesting	.889	.313	.878	.327	.842	.365	.882	.322

Table G.1—Panel A (continued)

Variable	Four-Year College Entrants		Two-Year College Entrants		Certificate Program Entrants		All College Entrants	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
On active duty	.035	.186	.058	.234	.025	.156	.045	.208
Earned income in 1990	4.517	7.446	9.021	10.569	7.192	9.097	6.671	9.316
Public institution	.681	.466	.906	.291	.346	.477	.767	.422
Dependent on parents' tax returns	.850	.356	.616	.486	.533	.500	.730	.443
Number of credit hours in 1990	12.551	4.093	9.525	4.999	1.541	4.470	10.687	5.171
Credit hours missing	.017	.131	.056	.230	.831	.375	.071	.258
Institution is historically black college or university	.019	.137	.002	.054	—	—	.011	.104
Mother's education missing	.025	.156	.049	.217	.041	.201	.037	.188
Father's occupation missing	.145	.352	.181	.386	.340	.475	.170	.376
Mother's occupation missing	.204	.403	.233	.423	.247	.433	.219	.414
Percentage full time missing	.134	.340	.146	.353	.283	.452	.146	.353
Percentage unemployed missing	.024	.154	.030	.172	.025	.158	.027	.162
Remedial math missing	.012	.109	.007	.088	.057	.233	.012	.110
Remedial reading missing	.012	.113	.011	.108	.061	.240	.014	.120
Educational expectation missing	.018	.134	.045	.208	.086	.282	.033	.180
Future occupation missing	.251	.433	.216	.412	.316	.466	.238	.426
Ability ratings missing	.010	.102	.013	.114	.049	.217	.013	.115

Table G.1—Panel A (continued)

Variable	Four-Year College Entrants		Two-Year College Entrants		Certificate Program Entrants		All College Entrants	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Mother worked before school missing	.053	.224	.069	.254	.134	.342	.064	.245
Active duty information missing	.029	.170	.052	.223	.025	.159	.039	.195
Earned income missing	.042	.200	.055	.228	.096	.296	.050	.218
Major = missing	.327	.469	.202	.402	.009	.099	.256	.436
Marital information missing	.030	.170	.059	.236	.046	.211	.043	.204
Dependent status missing	.014	.119	.022	.148	.054	.228	.020	.140

Table G.1

Variable Means and Standard Deviations, by College Segment
Panel B: Two-Year College Entrants, by Status in 1994

Variable	Two-Year Graduates		Two-Year Dropouts		Two-Year Still Enrolled	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Eligibility Variables						
High school diploma	.933	.249	.984	.123	.973	.161
Grade point average	1.462	1.315	1.684	1.400	1.568	1.327
Remedial math hours 1st year	.882	.322	.878	.327	.887	.318
Remedial writing hours 1st year	.878	.328	.923	.265	.940	.239
Self-reported above average mechanical ability	.378	.486	.464	.500	.359	.484
Self-reported above average writing ability	.143	.351	.285	.452	.351	.481
Self-reported above average leadership ability	.388	.488	.392	.489	.390	.492
U.S. citizen	.976	.153	.968	.173	.935	.247
Healthy	.591	.492	.460	.499	.433	.499
No disabilities in '90	.912	.283	.931	.253	.916	.278
No children	.208	.499	.126	.423	.019	.138
Ever done community service	.209	.407	.323	.468	.292	.458
Decision Variables						
White	.771	.421	.762	.426	.722	.451
Black, non-Hispanic	.093	.291	.101	.302	.044	.207
Other, non-Hispanic	.010	.102	.053	.226	.042	.203
Mother's education less than high school	.611	.488	.547	.499	.569	.499
SES < 25th percentile	.099	.299	.093	.291	.059	.238
Not enrolled full-time '89	.512	.501	.338	.474	.478	.503
Unemployed '90	.156	.364	.066	.249	.025	.158
Hours worked in school	28.160	16.614	25.135	15.039	27.612	11.347
Never married	.691	.462	.854	.353	.860	.349
Percent of enrolled months was working	.731	.388	.740	.394	.729	.362
Father's occupation not professional	.498	.501	.406	.492	.383	.490
Mother's occupation not professional	.415	.494	.492	.501	.455	.502

Table G.1—Panel B (continued)

Variable	Two-Year Graduates		Two-Year Dropouts		Two-Year Still Enrolled	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Future occupation not likely to be professional	.413	.493	.397	.490	.444	.501
Education expectations low	.073	.261	.057	.233	.059	.237
Getting away from area is important	.383	.487	.479	.500	.288	.457
Income to start not important in future job	.330	.471	.293	.456	.306	.464
Job security important in future job	.782	.413	.770	.421	.920	.273
Lives close to home	.440	.497	.408	.492	.634	.485
Other Control Variables						
Age 19 or 20	.377	.486	.325	.469	.394	.492
Age 21 or 22	.113	.317	.082	.276	.054	.229
Delay entry into college	.322	.468	.245	.431	.266	.445
Region = missing/foreign	.059	.236	.035	.184	.091	.290
Region = East	.046	.210	.066	.250	.001	.032
Region = Great Lakes	.169	.375	.127	.334	.151	.361
Region = Plains	.055	.229	.033	.179	.061	.241
Region = South East	.228	.421	.190	.393	.181	.388
Region = South West	.080	.272	.048	.216	.064	.247
Region = Rocky Mountains	.020	.142	.024	.155	.049	.219
Region 9 = Far East	.152	.360	.255	.437	.321	.471
Self-reported above average academic ability	.193	.395	.307	.462	.332	.475
Self-reported above average drive to succeed	.504	.501	.510	.501	.546	.502
Self-reported above average mathematics ability	.286	.453	.322	.468	.318	.470
Mother worked before elementary school	.462	.499	.403	.491	.358	.483
Got married between '89 and '94	.173	.379	.102	.303	.032	.178
New disability since '89	.994	.077	.989	.102	.998	.042
Number of months enrolled in '89	7.002	2.653	8.613	2.477	7.944	2.411
Major = social, behavioral, and life sciences	.018	.136	.043	.204	.041	.202
Major = physical sciences, mathematics, computer and information technology	.046	.212	.028	.167	.038	.195

Table G.1—Panel B (continued)

Variable	Two-Year Graduates		Two-Year Dropouts		Two-Year Still Enrolled	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Major = engineering	.103	.304	.150	.358	.107	.311
Major = education	.023	.150	.017	.132	.101	.304
Major = business and management	.228	.420	.153	.361	.102	.305
Major = health	.010	.101	.010	.101	.036	.188
Major = vocational/ technical	.123	.330	.107	.310	.064	.247
Major = other technical/ vocational	.108	.311	.097	.297	.024	.154
Aid package included grants, no loans	.116	.321	.158	.366	.076	.267
Aid package included grants and loans	.063	.244	.053	.225	.007	.084
Aid package included loans, no grants	.030	.173	.033	.180	.001	.039
Package included other aid	.041	.199	.022	.149	.062	.243
Total financial aid (1989–1990)	.606	1.595	.773	1.672	.170	.716
Total college costs (1989–1990)	4.438	3.134	5.535	4.097	4.807	3.411
Ratio aid to cost	10.900	24.182	12.062	23.876	3.103	11.927
Percent aid federal	15.290	33.982	14.541	32.181	4.851	21.338
Percent aid grants	14.017	32.401	18.437	37.026	12.142	32.502
Percent aid state	3.634	15.461	3.871	15.239	.877	5.775
Percent aid institutional	3.118	15.010	5.286	19.648	.966	7.307
Percent aid loans	6.376	21.202	5.225	18.831	.404	4.484
Federal aid variable missing	.747	.435	.716	.451	.853	.357
Work seems important/ interesting	.852	.355	.898	.302	.903	.298
On active duty	.070	.257	.031	.173	.081	.276
Earned income in '90	9.422	7.395	8.341	14.096	9.402	8.914
Public institution	.898	.303	.892	.311	.958	.202
Dependent on parents' tax returns	.574	.495	.664	. 473	.624	.488
Number of credit hours in '90	9.369	5.204	10.037	5.123	8.851	4.031
Credit hours missing	.061	.240	.070	.256	.013	.114
Institution is historically black college or university	.003	.058	.003	.062	.000	.000
Mother's education missing	.060	.238	.040	.196	.042	.202

Table G.1—Panel B (continued)

Variable	Two-Year Graduates Mean	Two-Year Graduates Std. Dev.	Two-Year Dropouts Mean	Two-Year Dropouts Std. Dev.	Two-Year Still Enrolled Mean	Two-Year Still Enrolled Std. Dev.
Father's occupation missing	.195	.397	.169	.375	.172	.381
Mother's occupation missing	.258	.439	.190	.393	.259	.442
Percent full time missing	.209	.407	.094	.293	.088	.286
Percent unemployed missing	.048	.214	.002	.046	.044	.207
Remedial math missing	.008	.091	.002	.046	.018	.136
Remedial reading missing	—	—	—	—	—	—
Educational expectation missing	.062	.242	.012	.113	.069	.256
Future occupation missing	.246	.432	.196	.398	.180	.387
Ability ratings missing	.022	.149	.007	.088	.000	.000
Mother worked before school missing	.082	.275	.084	.278	.005	.072
Active duty information missing	.047	.214	.042	.201	.086	.283
Earned income missing	.068	.253	.045	.209	.039	.197
Major = missing	.201	.402	.176	.382	.259	.442
Marital information missing	.078	.269	.012	.110	.106	.311
Dependent status missing	.034	.184	.008	.090	.020	.143

Table G.1

Variable Means and Standard Deviations, by College Segment
Panel C: Four-Year College Entrants, by Status in 1994

Variable	Four-Year Graduates Mean	Four-Year Graduates Std. Dev.	Four-Year Dropouts Mean	Four-Year Dropouts Std. Dev.	Four-Year Still Enrolled Mean	Four-Year Still Enrolled Std. Dev.
Eligibility Variables						
High school diploma	.992	.089	.993	.079	.988	.108
Grade point average	1.644	1.161	2.334	1.183	2.125	1.075
Remedial math hours 1st year	.927	.259	.940	.236	.942	.232
Remedial writing hours 1st year	.899	.301	.959	.196	.956	.204

Table G.1—Panel C (continued)

Variable	Four-Year Graduates Mean	Four-Year Graduates Std. Dev.	Four-Year Dropouts Mean	Four-Year Dropouts Std. Dev.	Four-Year Still Enrolled Mean	Four-Year Still Enrolled Std. Dev.
Self-reported above average mechanical ability	.315	.465	.385	.486	.303	.460
Self-reported above average writing ability	.365	.482	.439	.496	.359	.480
Self-reported above average leadership ability	.466	.499	.473	.499	.436	.496
U.S. citizen	.981	.133	.978	.143	.956	.204
Healthy	.516	.500	.557	.496	.520	.500
No disabilities in '90	.923	.266	.938	.240	.916	.277
No children	.159	.428	.041	.301	.056	.298
Ever done community service	.307	.461	.470	.499	.373	.484
Decision Variables						
White	.852	.355	.874	.331	.805	.396
Black, non-Hispanic	.058	.235	.041	.199	.085	.279
Other, non-Hispanic	.026	.161	.049	.217	.050	.219
Mother's education less than high school	.509	.500	.408	.491	.390	.488
SES < 25th percentile	.080	.273	.020	.143	.064	.246
Not enrolled full-time '89	.311	.463	.229	.420	.317	.466
Unemployed '90	.121	.326	.034	.181	.087	.283
Hours worked in school	24.531	16.899	21.095	17.231	21.819	16.439
Never married	.785	.410	.890	.311	.849	.357
Percent of enrolled months was working	.554	.422	.471	.427	.499	.431
Father's occupation not professional	.374	.484	.292	.454	.311	.463
Mother's occupation not professional	.427	.495	.386	.487	.325	.469
Future occupation not likely to be professional	.373	.484	.298	.457	.313	.464
Educational expectation low	.011	.108	.006	.082	.000	.000
Getting away from area is important	.451	.498	.277	.448	.344	.476
Income to start not important in future job	.405	.491	.406	.491	.343	.475
Job security important in future job	.738	.440	.696	.459	.740	.439
Lives close to home	.241	.428	.162	.368	.189	.392

Table G.1—Panel C (continued)

Variable	Four-Year Graduates		Four-Year Dropouts		Four-Year Still Enrolled	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Other Control Variables						
Age 19 or 20	.324	.468	.204	.403	.284	.452
Age 21 or 22	.050	.220	.017	.129	.015	.122
Delay entry into college	.169	.375	.059	.237	.066	.249
Region = missing/ foreign	.019	.137	.025	.158	.043	.204
Region = East	.092	.290	.104	.305	.047	.213
Region = Great Lakes	.196	.398	.218	.413	.167	.373
Region = Plains	.122	.328	.076	.265	.093	.291
Region = Southeast	.205	.404	.176	.381	.190	.393
Region = Southwest	.096	.295	.084	.278	.194	.396
Region = Rocky Mountains	.044	.206	.015	.124	.040	.198
Region = Far East	.053	.225	.088	.284	.088	.284
Self-reported above average academic ability	.315	.465	.562	.496	.379	.486
Self-reported above average drive to succeed	.450	.498	.621	.485	.509	.500
Self-reported above average mathematics ability	.361	.480	.473	.499	.401	.491
Mother worked before elementary school	.478	.500	.426	.494	.469	.500
Got married between '89 and '94	.151	.358	.073	.260	.098	.298
New disability since '89	.992	.087	.995	.066	.989	.101
Number of months enrolled in '89	8.651	1.969	9.548	1.142	9.289	1.486
Major = social, behavioral, and life sciences	.077	.267	.095	.293	.064	.246
Major = physical sciences, mathematics, computer and information technology	.060	.239	.053	.224	.057	.232
Major = engineering	.098	.298	.151	.359	.139	.347
Major = education	.019	.138	.012	.112	.026	.161
Major = business and management	.157	.364	.162	.369	.193	.395
Major = health	.031	.174	.043	.203	.052	.224
Major = vocational/ technical	.021	.145	.012	.110	—	—

Table G.1—Panel C (continued)

Variable	Four-Year Graduates Mean	Four-Year Graduates Std. Dev.	Four-Year Dropouts Mean	Four-Year Dropouts Std. Dev.	Four-Year Still Enrolled Mean	Four-Year Still Enrolled Std. Dev.
Major = other technical/ vocational	.040	.196	.045	.209	.048	.215
Aid package included grants, no loans	.192	.394	.232	.422	.201	.401
Aid package included grants and loans	.195	.397	.221	.415	.177	.382
Aid package included loans, no grants	.055	.228	.054	.227	.010	.102
Package included other aid	.039	.194	.041	.200	.027	.163
Total financial aid (1989–1990)	1.970	2.990	2.852	4.158	1.901	2.983
Total college costs (1989–1990)	6.752	4.390	9.328	5.695	6.985	4.635
Ratio aid to cost	26.506	34.345	28.829	34.574	26.651	37.353
Percent aid federal	26.548	38.687	20.794	33.794	18.033	31.403
Percent aid grants	29.559	39.946	32.731	39.738	26.518	37.766
Percent aid state	7.650	20.506	8.216	21.047	6.330	17.269
Percent aid institutional	11.345	26.562	19.246	32.689	13.586	28.379
Percent aid loans	13.899	28.164	13.174	25.771	8.408	19.497
Federal aid variable missing	.494	.500	.437	.496	.579	.494
Work seems important/ interesting	.901	.298	.882	.322	.895	.306
On active duty	.077	.266	.018	.134	.029	.170
Earned income in '90	5.639	7.325	4.054	7.678	4.304	6.704
Public institution	.770	.421	.593	.491	.823	.381
Dependent on parents' tax returns	.747	.434	.908	.288	.822	.383
Number of credit hours in '90	11.896	4.268	12.901	4.065	12.428	3.795
Credit hours missing	.007	.086	.024	.154	.010	.104
Institution is historically black college or university	.027	.163	.015	.123	.018	.135
Mother's education missing	.040	.197	.016	.127	.029	.170
Father's occupation missing	.193	.395	.116	.321	.164	.371
Mother's occupation missing	.227	.419	.192	.394	.208	.407
Percent full time missing	.163	.369	.112	.315	.159	.366

Table G.1—Panel C (continued)

Variable	Four-Year Graduates Mean	Four-Year Graduates Std. Dev.	Four–Year Dropouts Mean	Four–Year Dropouts Std. Dev.	Four-Year Still Enrolled Mean	Four-Year Still Enrolled Std. Dev.
Percent unemployed missing	.025	.156	.016	.129	.046	.211
Remedial math missing	.004	.064	.014	.121	.015	.125
Remedial reading missing	—	—	—	—	—	—
Educational expectation missing	.036	.188	.011	.108	.012	.112
Future occupation missing	.248	.432	.268	.443	.201	.402
Ability ratings missing	—	—	.014	.118	.014	.120
Mother worked before school missing	.050	.218	.049	.217	.067	.251
Active duty information missing	.021	.145	.026	.160	.052	.222
Earned income missing	.049	.217	.036	.187	.048	.215
Major = missing	.346	.476	.321	.467	.319	.467
Marital information missing	.035	.184	.022	.149	.044	.207
Dependent status missing	.025	.157	.008	.090	.018	.134

Table G.2

Multinomial Logit Coefficient Estimates and Standard Errors Plus Marginal Effect Estimates for College Entrants Model

Variable	Four-Year Entrants Coeff. Est.	Four-Year Entrants Std. Error	Two-Year Entrants Coeff. Est.	Two-Year Entrants Std. Error	Marginal Effects Four-Year	Marginal Effects Two-Year	Marginal Effects Cert.
White	.446	.282	−1.427	1.320	.110	−.110	−.000
Black, non-Hispanic	−.480	.390	−.979	1.519	−.118	.118	−.000
Other, non-Hispanic	1.712	.479	−10.779	3.066	.352	−.352	−.000
Age 19 or 20	−.102	.169	−.255	.764	−.025	.025	−.000
Age 21 or 22	.051	.376	.560	1.369	.012	−.012	.000
No disabilities in 1990	.252	.230	.633	1.334	.062	−.063	.000

Table G.2 (continued)

Variable	Four-Year Entrants		Two-Year Entrants		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year	Two-Year	Cert.
High school diploma	1.980	.579	2.269	1.387	.389	−.389	.000
Delay entry into college	−.680	.242	1.808	.947	−.167	.166	.000
U.S. citizen	−1.101	.686	3.965	3.324	−.251	.251	.000
Mother's education less than high school	−.311	.143	.847	.750	−.077	.077	.000
Mother's education missing	−.322	.413	.792	1.414	−.080	.079	.000
SES < 25th percentile	.387	.348	−.25	.969	.095	.095	−.000
Region = missing/ foreign	.571	.441	−.051	1.624	.139	−.139	−.000
Region = East	.817	.298	2.306	1.236	.195	−.195	.000
Region = Great Lakes	.512	.218	−1.856	1.188	.126	−.126	−.000
Region = Plains	.620	.289	2.048	1.337	.150	−.150	.000
Region = Southeast	.154	.219	.605	1.081	.038	−.038	.000
Region = Southwest	1.163	.279	−1.401	1.481	.267	−.267	−.000
Region = Rocky Mountains	.400	.411	1.149	2.286	.098	−.098	.000
Region = Far East	−1.258	.255	.538	1.198	−.292	.291	.000
Self-reported above average academic ability	.222	.160	−.358	.952	.055	−.055	−.000
Self-reported above average mechanical ability	−.091	.140	2.839	.769	−.022	.022	.000
Self-reported above average health	.259	.139	−1.316	.644	.064	−.064	−.000
Ability ratings missing	−.444	.726	−3.128	5.221	−.109	.109	−.000
Self-reported above average drive to succeed	−.173	.140	−.555	.675	−.043	.043	−.000
Self-reported above average leadership ability	.459	.143	−.307	.664	.114	−.114	−.000
Self-reported above average math ability	.133	.151	−1.233	.840	.033	−.033	−.000

Table G.2 (continued)

Variable	Four-Year Entrants Coeff. Est.	Four-Year Entrants Std. Error	Two-Year Entrants Coeff. Est.	Two-Year Entrants Std. Error	Marginal Effects Four-Year	Marginal Effects Two-Year	Marginal Effects Cert.
Self–reported above average writing ability	.496	.150	.079	.804	.123	–.123	–.000
Father's occupation professional	–.348	.148	–.503	.810	–.086	.086	–.000
Father's occupation missing	–.437	.206	.970	.823	–.108	.108	.000
Mother's occupation not professional	–.024	.157	–1.180	.781	–.006	.006	–.000
Mother's occupation missing	.264	.189	–.976	.807	.065	–.065	–.000
Mother worked before elementary school	.204	.137	1.244	.661	.051	–.051	.000
Mother worked before school missing	–.022	.321	.997	1.538	–.005	.005	.000
No children	–.105	.189	–.575	.667	–.026	.026	–.000
Never married	–.302	.475	–.824	1.472	–.075	.075	–.000
Married between '89 and '94	–.150	.482	–1.324	1.542	–.037	.037	–.000
Marital information missing	–.311	.725	–4.438	2.540	–.077	.077	–.000
No new disability	.494	.750	–5.396	2.412	.125	–.114	–.010
Grade point average	.108	.052	.006	.219	.027	–.027	–.000
Lives close to home	–.776	.143	–.282	.643	–.190	.190	.000
Number of months enrolled in '89	.115	.036	–.054	.119	.028	–.028	–.000
Not enrolled full-time in '89	–.096	.181	1.015	.980	–.024	.023	.000
Percent full-time missing	.047	.243	.978	1.066	.011	–.011	.000
Percent of enrolled months was working	–1.017	.180	–.887	.969	–.254	.254	–.000
Had unemployment spell, 1990	.236	.251	–.465	.878	.058	–.058	–.000
Hours worked per week while enrolled	.009	.004	–.006	.024	.002	–.002	–.000

Table G.2 (continued)

Variable	Four-Year Entrants Coeff. Est.	Four-Year Entrants Std. Error	Two-Year Entrants Coeff. Est.	Two-Year Entrants Std. Error	Marginal Effects Four-Year	Marginal Effects Two-Year	Marginal Effects Cert.
Major = social, behavioral, and life sciences	1.230	.318	1.152	2.844	.277	–.277	.000
Major = physical sciences, mathematics, computer and information technology	1.107	.328	5.664	1.995	.250	–.255	.004
Major = engineering	.381	.247	1.414	1.821	.094	–.094	.000
Major = education	.844	.475	3.335	3.101	.199	–.199	.000
Major = business and management	.550	.223	3.000	1.816	.135	–.135	.000
Major = health	1.718	.423	2.190	3.303	.351	–.351	.000
Major = vocational/ technical	–1.340	.411	4.548	1.775	–.303	.298	.004
Major = other technical/ professional	–.227	.291	4.023	1.799	–.057	.055	.001
Major = missing	1.187	.206	–1.139	2.214	.282	–.282	–.000
Aid package included grants, no loans	–1.555	.710	11.115	6.210	–.437	.045	.392
Aid package included grants and loans	–1.407	.841	8.710	6.405	–.344	.241	.103
Aid package included loans, no grants	–.624	1.106	5.398	6.538	–.346	.334	.011
Package included other aid	–1.884	.893	7.258	6.552	–.390	.318	.071
Total financial aid (1989–1990)	.145	.078	–.323	.321	.036	–.036	–.000
Total college costs (1989–1990)	.104	.022	.099	.081	.026	–.026	.000
Ratio aid to cost	.006	.005	.027	.020	.001	–.001	.000
Percent aid federal	–.003	.004	.007	.027	–.000	.000	.000
Percent aid grants	–.005	.006	–.036	.031	–.001	.001	–.000
Percent aid state	.007	.005	–.052	.044	.001	–.001	–.000
Percent aid institutional	.010	.004	.015	.029	.002	–.002	.000
Percent aid loans	.005	.010	.033	.031	.001	–.001	.000

Table G.2 (continued)

Variable	Four-Year Entrants		Two-Year Entrants		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year	Two-Year	Cert.
Federal aid variable missing	−1.881	.890	8.402	6.316	−.435	.433	.001
Ever done community service	−.118	.141	−.233	.717	−.029	.029	−.000
Remedial math hours 1st year	−.173	.237	.027	1.645	−.043	.043	.000
Remedial math missing	1.945	.833	6.580	2.598	.369	−.376	.006
Remedial reading hours 1st year	.593	.263	.652	1.825	.145	−.145	.000
Remedial reading missing	−.693	.735	.515	4.088	−.167	.167	.000
Income to start not important in future job	.125	.142	1.063	.737	.031	−.031	.000
Job security important in future job	−.640	.165	1.243	.987	−.167	.157	.000
Work seems important/ interesting	−.000	.207	.172	1.047	.031	.000	.000
On active duty	.682	.308	−3.947	2.149	.164	−.164	−.000
Active duty information missing	−1.257	.666	.521	3.027	−.283	.283	.000
Educational expectations low	−1.432	.502	3.822	.822	−.316	.314	.002
Educational expectations missing	−.680	.397	2.710	1.201	−.165	.164	.000
Future occupation not likely to be professional	−.168	.153	.478	.750	−.042	.042	.000
Future occupation missing	−.067	.178	−.615	.897	−.016	.016	−.000
Earned income in '90	−.035	.008	−.013	.042	−.008	.008	.000
Earned income missing	−.144	.357	.173	1.362	−.036	.036	.000
Getting away from area is important	−.095	.137	.133	.637	−.023	.023	.000
Public institution	.013	.218	−1.921	.962	.003	−.003	−.000

Table G.2 (continued)

Variable	Four-Year Entrants Coeff. Est.	Four-Year Entrants Std. Error	Two-Year Entrants Coeff. Est.	Two-Year Entrants Std. Error	Marginal Effects Four-Year	Marginal Effects Two-Year	Marginal Effects Cert.
Dependent on parents' tax returns	.553	.176	1.073	.798	.137	–.137	.000
Dependent status missing	–.171	.619	3.155	2.046	–.043	.042	.000
Number of credit hours in '90	.051	.016	–.063	.086	.012	–.012	–.000
Credit hours missing	–1.397	.474	4.111	1.255	–.312	.309	.002
Institution is historically black college or university	3.044	.754	—	—	.457	–.457	–.000
Constant	–2.702	1.621	–18.957	8.918	—	—	—

NOTE: Marginal effect for dummy variables measure change in outcomes when variable changes from 0 to 1.

Table G.3

Coefficient Estimates and Standard Errors Plus Marginal Effect Estimates for Status Five Years After Entry : Multinomial Logit Model
Panel A: Two-Year Students

	Two-Year Graduates		Two-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Two-Year Drop-outs	Two-Year Grad-uates	Two-Year Still Enrolled
Eligibility Variables							
White	–.765	.345	–.280	.480	.018	–.136	–.002
Black, non-Hispanic	–1.947	.456	–.151	.727	.288	–.111	–.005
Other, non-Hispanic	–4.015	1.136	–.184	1.005	–.104	–.187	–.011
Age 19 or 20	.469	.252	.931	.349	–.051	.036	.009
Age 21 or 22	.687	.468	–.507	.689	–.052	.080	–.006
No disabilities in '90	–.635	.346	–1.023	.464	.068	–.047	–.010
High school diploma	–1.727	.684	–.895	1.058	.070	–.429	–.007

Table G.3—Panel A (continued)

	Two-Year Graduates		Two-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Two-Year Drop-outs	Two-Year Grad-uates	Two-Year Still Enrolled
Delay entry into college	–.626	.320	.361	.454	.184	.012	.018
U.S. citizen	.863	1.054	–.724	1.526	.013	.101	–.011
Mother's education less than high school	.238	.213	–.324	.308	.030	.063	–.002
Mother's education missing	.869	.487	.356	.694	–.020	.183	.003
SES < 25th percentile	–.992	.420	–.803	.605	.047	–.093	–.005
Region = missing/ foreign	1.147	.675	1.363	1.100	–.168	–.039	–.000
Region = East	–.973	.427	–5.367	2.428	–.015	–.113	–.017
Region = Great Lakes	.570	.308	.815	.485	–.117	–.017	.001
Region = Plains	.117	.476	.912	.681	–.105	–.070	.003
Region = Southeast	.110	.298	.790	.486	–.045	–.018	.008
Region = Southwest	–.033	.419	.504	.610	–.134	–.107	–.004
Region = Rocky Mountains	–.552	.628	1.222	.776	–.058	–.097	.017
Region = Far East	–.950	.334	.780	.511	.265	–.006	.040
Self-reported high academic ability	–.175	.241	.116	.331	–.019	–.042	.000
Self-reported high mechanical ability	–.610	.193	–.543	.266	.079	–.039	–.002
Healthy	1.110	.203	–.535	.307	–.135	.077	–.015
Self-reported above average drive to succeed	–.006	.197	.102	.276	.020	.014	.002
Self-reported above average leadership ability	–.147	.200	–.387	.288	–.035	–.051	–.006
Self-reported above average mathematical ability	.290	.219	1.074	.319	–.052	.005	.011
Self-reported above average writing ability	–1.105	.233	.206	.289	.014	–.145	.003

Table G.3—Panel A (continued)

	Two-Year Graduates		Two-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Two-Year Dropouts	Two-Year Graduates	Two-Year Still Enrolled
Father's occupation not professional	.138	.220	−.460	.307	.041	.056	−.003
Father's occupation missing	.549	.283	.071	.401	−.000	.108	.000
Mother's occupation not professional	−.745	.225	.154	.331	.065	−.069	.005
Mother's occupation missing	.115	.277	.891	.384	−.075	−.042	.006
Mother worked before elementary school	.166	.199	.079	.284	−.046	−.009	−.001
Mother worked before elementary school missing	−.622	.408	−4.875	1.247	.132	−.018	−.015
No children	−.075	.241	−1.319	.657	.057	.032	−.012
Never married	−.729	.595	—	—	.087	−.042	.005
Got married between '89 and '94	.165	.593	—	—	−.031	.000	−.001
Marital information missing	.494	.934	1.367	.792	−.078	.005	.017
No new disability since '89	.072	1.156	.842	1.989	−.059	−.031	.005
Grade point average	.026	.071	−.091	.099	−.016	−.008	−.002
Lives close to home	.164	.196	1.645	.290	.043	.063	.035
Number of months enrolled in '89	−.299	.046	−.182	.073	.012	−.039	−.001
Not enrolled full time in '89	.288	.231	.116	.314	−.014	.037	.000
Percent full-time missing	.402	.342	−.076	.519	−.050	.024	−.003
Percent of enrolled months was working	−.607	.289	−.132	.395	.208	.062	−.004
Unemployment spell in '90	1.275	.340	−1.162	.687	−.113	.114	−.011

Table G.3—Panel A (continued)

	Two-Year Graduates		Two-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Two-Year Drop-outs	Two-Year Grad-uates	Two-Year Still Enrolled
Hours worked per week while enrolled	.013	.007	.002	.010	−.002	.000	−.000
Major = social, behavioral, and life sciences	−.363	.575	−.846	.678	−.118	−.118	−.010
Major = physical sciences, mathematics, computer and info. technology	.184	.514	.124	.661	−.144	−.099	−.007
Major = engineering	.141	.339	−1.345	.497	−.050	−.019	−.011
Major = education	.760	.636	−.508	.885	−.152	−.061	−.010
Major = business and management	1.319	.313	−1.527	.464	−.146	.073	−.016
Major = health	.557	.801	.531	.804	−.190	−.128	−.009
Major = vocational/ technical	−.335	.374	−1.309	.620	.161	.045	−.006
Major = other technical/ professional	.195	.369	−1.579	.658	.028	.061	−.010
Major = missing	.584	.300	−.749	.395	−.180	−.071	−.016
Aid package included grants, no loans	3.677	2.164	6.562	2.406	−.181	.408	.395
Aid package included grants and loans	3.603	2.300	4.955	3.318	−.180	.573	.155
Aid package included loans, no grants	2.741	2.587	3.943	5.887	−.147	.533	.150
Package included other aid	4.784	2.416	10.601	3.456	−.215	−.093	.942
Total financial aid ('89–'90)	−.003	.126	.109	.281	−.024	−.019	−.000
Total college costs ('89–'90)	−.031	.034	.010	.047	−.012	−.014	−.000
Ratio aid to cost	−.004	.008	−.030	.018	−.000	−.000	−.000
Percent aid federal	.002	.007	−.018	.009	.000	.000	−.000

Table G.3—Panel A (continued)

	Two-Year Graduates		Two-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Two-Year Drop-outs	Two-Year Grad-uates	Two-Year Still Enrolled
Percent aid grants	.005	.012	.041	.024	−.000	.000	.000
Percent aid state	.003	.008	−.031	.014	−.000	−.000	−.000
Percent aid institutional	−.006	.008	−.036	013	−.000	−.001	−.000
Percent aid loan	.017	.016	.039	.056	−.002	.001	.000
Federal aid variable missing	4.093	2.437	8.164	3.519	−.056	.438	.165
Ever done community service	−.190	.210	.046	.292	.034	−.004	.002
Remedial math hours 1st year	.610	.349	−.628	.452	.004	.080	−.009
Remedial math missing	−1.204	1.784	5.731	1.615	−.193	−.163	.329
Remedial reading hours 1st year	−1.175	.372	−.134	.564	.055	−.213	.001
Income to start not important in future job	.654	.206	.584	.308	−.083	.040	.002
Job security important in future job	−.338	.229	2.022	.426	.075	.008	.019
Work seems important/ interesting	−.448	.298	.169	.433	.042	−.041	.004
On active duty	1.013	.449	−.685	.623	−.142	−.004	−.010
Active duty information missing	−.005	1.083	.023	1.629	.160	.123	.009
Educational expectations low	1.037	.484	1.595	.702	−.042	.200	.034
Educational expectations missing	2.200	.615	1.883	.764	−.144	.317	.014
Future occupation not likely to be professional	.470	.211	−.108	.306	−.013	.070	−.002
Future occupation missing	.176	.261	−1.053	.378	.011	.039	−.009

Table G.3—Panel A (continued)

	Two-Year Graduates		Two-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Two-Year Drop-outs	Two-Year Grad-uates	Two-Year Still Enrolled
Earned income in '90	.008	.008	–.018	.011	.004	.004	.000
Earned income missing	–.293	.477	–.631	.735	.064	–.003	–.003
Getting away from area is important	–.666	.191	–.433	.280	.082	–.045	–.000
Public institution	.093	.342	–.246	.579	–.008	.009	–.003
Dependent on parents' tax returns	–.002	.226	.037	.335	–.089	–.070	–.004
Dependent status missing	.396	1.101	1.411	1.405	–.038	.035	.028
Number of credit hours in '90	.030	.024	–.062	.032	–.008	–.001	–.001
Credit hours missing	–.126	.515	–2.617	.998	.251	.154	–.010
Institution is historically black college or university	1.594	1.391	—	—	–.210	–.140	–.012
Constant	1.019	3.138	–5.101	4.641	—	—	—

NOTE: Marginal effect for dummy variables measure change in outcomes when variable changes from 0 to 1.

Table G.3

Coefficient Estimates and Standard Errors Plus Marginal Effect Estimates for Status Five Years After Entry : Multinomial Logit Model
Panel B: Four-Year Students

	Four-Year Dropouts		Four-Year Graduates		Four-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
				Eligibility Variables					
White	.547	.420	−.231	.408	−.072	.476	.147	−.030	.002
Black, non-Hispanic	−1.005	.556	−2.182	.573	−.758	.607	−.024	−.165	.018
Other, non-Hispanic	1.560	.646	.345	.743	.675	.758	.366	−.061	−.001
Age 19 or 20	.196	.248	.361	.262	.258	.288	−.016	.022	.000
Age 21 or 22	.128	.577	.402	.550	.215	.803	−.040	.027	−.007
No disabilities in '90	−.297	.358	−.289	.372	−.747	.407	.021	.018	−.050
High school diploma	1.149	1.039	.914	.962	−.582	1.056	.227	.160	−.021
Delay entry into college	−1.180	.370	−.744	.350	−1.789	.492	−.114	−.009	−.092
U.S. citizen	−.488	.984	.627	1.392	−.531	1.161	−.145	.108	−.068
Mother's education less than high school	−.331	.201	−.139	.218	−.504	.245	−.051	.001	−.041
Mother's education missing	−.661	.631	.190	.577	−.206	.693	−.153	.019	−.031
SES < 25th percentile	−.637	.493	.192	.451	.170	.526	−.100	.101	.051
Region = missing/ foreign	1.751	.689	.915	.754	2.402	.784	.107	−.085	.185

Table G.3—Panel B (continued)

	Four-Year Dropouts		Four-Year Graduates		Four-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
Region = East	.458	.392	.293	.410	−.185	.528	.124	.049	−.027
Region = Great Lakes	.892	.301	.846	.325	.949	.381	.062	.036	.033
Region = Plains	.655	.429	1.168	.446	.917	.513	−.000	.138	.034
Region = Southeast	.136	.300	.400	.322	.562	.376	−.025	.038	.043
Region = Southwest	.916	.406	1.016	.423	2.056	.450	.001	.022	.221
Region = Rocky Mountains	−.431	.627	.883	.566	1.100	.655	−.151	.157	.133
Region = Far East	−1.469	.340	−1.867	.417	−1.156	.441	−.126	−.147	−.025
Self-reported high academic ability	.466	.220	−.049	.243	−.075	.267	.110	−.029	−.019
Self-reported high mechanical ability	−.231	.191	−.535	.207	−.713	.237	.037	−.036	−.039
Healthy	.789	.197	.697	.210	.763	.235	.043	.014	.015
Self-reported above average drive to succeed	.156	.192	−.562	.208	−.157	.232	.070	−.101	−.006
Self-reported above average leadership ability	.246	.195	.488	.212	.192	.238	.021	.069	.002
Self-reported above average mathematical ability	.247	.209	.432	.226	.254	.250	−.002	.038	−.000
Self-reported above average writing ability	.059	.202	.219	.219	.151	.246	.036	.064	.026
Father's occupation not professional	−.509	.208	−.179	.227	−.292	.255	−.085	.002	−.011

Table G.3—Panel B (continued)

	Four-Year Dropouts		Four-Year Graduates		Four-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
Father's occupation missing	−.506	.290	.209	.298	−.344	.343	−.120	.047	−.035
Mother's occupation not professional	−.275	.221	−.211	.240	−.576	.268	.008	.020	−.030
Mother's occupation missing	.537	.280	.707	.295	.393	.325	.040	.071	−.000
Mother worked before elementary school	.302	.192	.393	.205	.192	.231	.022	.037	−.003
Mother worked before elementary school missing	−.726	.434	−.882	.453	−.273	.511	−.057	−.069	.029
No children	−.639	.313	.003	.258	−.556	.389	−.103	.059	−.033
Never married	−.819	.660	−.467	.650	.025	1.036	−.104	.004	.050
Got married between '89 and '94	−.415	.676	.293	.667	.971	1.038	−.129	.029	.132
Marital information missing	.020	1.194	.713	1.083	1.065	1.535	−.100	.060	.095
No new disability since '89	.638	1.020	.489	1.232	−.122	1.073	.091	.046	−.052
Grade point average	.288	.073	−.146	.078	.224	.091	.058	−.048	.017
Lives close to home	−.434	.207	−.355	.221	−.662	.260	−.061	−.031	−.049
Number of months enrolled in '89	.101	.062	−.133	.054	−.050	.069	.044	−.016	.000
Not enrolled full-time in '89	−.000	.256	.066	.267	.040	.308	−.019	−.000	−.003

Table G.3—Panel B (continued)

	Four-Year Dropouts		Four-Year Graduates		Four-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
Percent full-time missing	.227	.369	.360	.372	.392	.419	−.009	.022	.016
Percent of enrolled months was working	−1.386	.253	−1.474	.276	−1.404	.303	−.112	−.104	−.048
Unemployment spell in '90	.244	.416	1.043	.374	1.037	.433	−.109	.078	.042
Hours worked per week while enrolled	.011	.006	.023	.007	.016	.007	−.000	.002	.000
Major = social, behavioral, and life sciences	1.250	.431	.879	.454	1.249	.534	.160	.021	.066
Major = physical sciences, mathematics, computer and information technology	1.351	.479	1.261	.504	1.783	.566	.090	.044	.116
Major = engineering	.475	.332	.063	.366	.687	.413	.063	−.039	.057
Major = education	1.589	.745	.931	.762	2.088	.779	.122	−.054	.156
Major = business and management	1.048	.319	.905	.340	1.332	.396	.037	−.003	.054
Major = health	2.335	.667	1.982	.701	3.065	.721	.113	−.001	.216
Major = vocational/ technical	−1.242	.541	−1.702	.562	—	—	−.138	−.151	.089
Major = other technical/ professional	−.089	.391	−.842	.454	.049	.505	.011	−.113	.022
Major = missing	1.421	.291	1.414	.305	1.830	.353	.096	.071	.100

Table G.3—Panel B (continued)

	Four-Year Dropouts		Four-Year Graduates		Four-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
Aid package included grants, no loans	−.420	.909	−1.778	.869	1.022	1.351	−.275	−.286	−.059
Aid package included grants and loans	−.024	1.060	−1.516	1.044	1.190	1.504	−.242	−.262	−.043
Aid package included loans, no grants	−.152	1.397	−1.994	1.418	−.899	1.954	−.209	−.220	−.105
Package included other aid	.060	1.165	−.977	1.221	.289	1.618	−.286	−.227	−.118
Total financial aid ('89 – '90)	.178	.101	.215	.104	.150	.110	.017	.021	.004
Total college costs ('89 – '90)	.112	.029	.081	.033	.122	.036	.015	.004	.007
Ratio aid to cost	.002	.007	−.005	.007	.014	.008	.000	−.001	.001
Percent aid federal	−.010	.006	.002	.006	−.008	.008	−.002	.001	−.000
Percent aid grants	−.000	.008	.005	.010	−.009	.010	−.000	.000	−.001
Percent aid state	.001	.007	.012	.008	.011	.009	−.000	.001	.000
Percent aid institutional	−.000	.006	.008	.007	.006	.008	−.000	.001	.000
Percent aid loans	.010	.012	.017	.013	.008	.015	−.000	.001	−.000
Federal aid variable missing	−.981	1.128	−1.103	1.205	.807	1.564	−.311	−.265	.029
Ever done community service	−.091	.190	−.396	.211	−.197	.229	.019	−.048	−.004

Table G.3—Panel B (continued)

	Four-Year Dropouts		Four-Year Graduates		Four-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
Remedial math hours 1st year	−.481	.339	.256	.381	.272	.461	−.157	.052	.030
Remedial math missing	2.789	1.296	.958	1.564	2.640	1.402	.150	−.161	.038
Remedial reading hours 1st year	.412	.408	−.620	.395	.858	.540	.148	−.078	.085
Income to start not important in future job	.398	.202	.665	.214	.346	.245	−.005	.054	−.008
Job security important in future job	−.628	.222	−.521	.238	−.450	.270	−.069	−.027	−.006
Work seems important/ interesting	−.402	.290	−.006	.319	−.142	.363	−.055	.041	.008
On active duty	.835	.551	1.657	.475	1.280	.620	−.051	.177	.031
Active duty information missing	−1.173	.996	−1.570	1.326	−.832	1.190	−.128	−.139	−.026
Educational expectations low	−.171	.649	−.214	.682	—	—	−.092	−.076	−.023
Educational expectations missing	.379	.726	1.201	.687	.296	.869	−.145	.023	−.065
Future occupation not likely to be professional	−.051	.214	.133	.228	−.267	.259	−.032	.014	−.037
Future occupation missing	−.219	.244	.176	.264	−.525	.300	−.044	.052	−.048

Table G.3—Panel B (continued)

	Four-Year Dropouts		Four-Year Graduates		Four-Year Still Enrolled		Marginal Effects		
	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Coeff. Est.	Std. Error	Four-Year Dropouts	Four-Year Graduates	Four-Year Still Enrolled
Earned income in '90	−.044	.013	−.018	.011	−.032	.015	−.007	.000	−.001
Earned income missing	−.398	.524	−.550	.523	−.041	.627	−.033	−.052	.029
Getting away from area is important	−.739	.188	−.055	.199	−.469	.228	−.096	.071	−.010
Public institution	−.316	.304	.239	.329	.807	.380	−.110	.040	.073
Dependent on parents' tax returns	1.033	.265	.393	.258	.465	.304	.154	.000	.008
Dependent status missing	−.066	1.108	.719	.945	−1.706	1.489	−.066	.143	−.102
Number of credit hours in '90	.072	.024	.041	.025	.065	.028	.008	.000	.002
Credit hours missing	−1.498	.611	−2.650	.854	−1.600	.873	−.141	−.189	−.064
Institution is historically black college or university	4.143	1.186	4.014	1.202	2.822	1.265	.265	.153	−.055
Constant	−2.539	2.329	−.744	2.644	−2.987	2.932	—	—	—

NOTE: Marginal effect for dummy variables measure change in outcomes when variable changes from 0 to 1.

The armed services prefer to recruit high-quality youth because of their better performance and lower attrition. But high-quality youth are increasingly interested in attending college. How can military service be made more compatible with college plans instead of being perceived as an alternative to college?

The essays in this book examine several aspects of this question: How have high school seniors' intentions to enlist or to attend either two-year or four-year college changed over the past 20 years? How far do civilian and military education programs go in paying for public or private higher education? The editors conclude that youth with interest in the military are most likely to attend two-year colleges and often need to work at the same time. Offering a stipend, higher military pay, or other means of offsetting the cost of attending school may be an effective recruiting strategy with this group.

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